



**GROUNDWATER MONITORING – NOVEMBER 2025**

**TOLL SITE TOMAGO**

**Prepared for TOLL GROUP**

**Prepared by RCA Australia**

**RCA ref 12513e-228/0**

**DECEMBER 2025**



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19 December 2025

Toll Group  
Old Punt Road  
Tomago NSW 2322

Attention: Gaston-Jeane Forget  
CC: Paul Nicou

Geotechnical Engineering  
Engineering Geology  
Environmental Engineering  
Hydrogeology  
Construction Materials Testing  
Environmental Monitoring  
Noise & Vibration  
Occupational Hygiene

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## GROUNDWATER MONITORING REPORT – NOVEMBER 2025

### TOLL SITE, TOMAGO

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## 1 INTRODUCTION

This report presents the findings of a groundwater monitoring round undertaken at the Toll Group's (Toll) Tomago site as part of the continuation of a monitoring programme being implemented at the site.

A total of eleven (11) monitoring wells are located at the site, however one (1) well (MW8) has its entire screened interval situated below the groundwater surface and was replaced (by MW8a) and one (1) well (MW5) is inaccessible under a shed / container. As such, nine (9) of the groundwater wells are used for long term monitoring. Four (4) of the wells are situated in close proximity to the current and former petroleum storage area and the remainder are situated around the site. The locations of the wells are included on **Drawing 1, Appendix A**.

Historical monitoring has identified the presence of hydrocarbons and metals in some wells and ammonia in all wells. The Environment Protection Licence (EPL #20125) for the site was amended, formally in March 2022, to include monitoring of selected groundwater wells at the site. The current EPL requires the following six-monthly monitoring in relation to groundwater:

- Hydrocarbons at MW1, MW2, MW3 and MW4.
- pH, electrical conductivity (EC), ammonia, nitrate and nitrite (oxidable nitrogen) and standing water level from MW1, MW2, MW3, MW4, MW6 and MW10.
- Metals at MW1, MW2, MW3, MW4 and MW10.

This report presents the findings of the November 2025 round of monitoring implemented in accordance with the EPL. It is noted that additional works were intended to be undertaken in accordance with a Sampling and Analysis Quality Plan (SAQP, Ref [1]), issued under section 8 of the EPL and endorsed by the appointed NSW EPA accredited Contaminated Land Site Auditor however that there were delays associated with the Toll approval process such that additional wells have not yet been installed. Amendment of the SAQP is pending to address subsequent NSW EPA requests.

## 2 SITE IDENTIFICATION AND DESCRIPTION

The site is described as 12 Old Punt Road, Tomago and Lot 7 DP 562394. The site is currently used for the storage of ammonium nitrate, heavy vehicle storage and maintenance works.

Additional site details are shown in **Table 1**.

**Table 1** *Site Details*

<b>Current zoning (Ref [2])</b>	E4 – General Industrial
<b>Current use</b>	Storage of Ammonium Nitrate
<b>Size of site</b>	2.59 ha
<b>Land use to the:</b>	
<b>North</b>	Light industrial – petroleum fuel dispensing facility
<b>South</b>	Light industrial
<b>East</b>	Old Punt Road, light industrial
<b>West</b>	Vacant, vegetated land
<b>Nearest sensitive receptor (human health)</b>	Adjacent residence (although considered to be used as a commercial property) and onsite workers
<b>Nearest sensitive receptor (environmental)</b>	Unnamed creek approximately 900 m to northwest, marsh lands approximately 700 m to the west and unnamed creek approximately 1.0 km to southwest – both of which connect to Hunter River.

**Drawing 1, Appendix A** shows the locality and the layout of the site.

## 3 FIELDWORK

An environmental engineer, experienced in the sampling and handling of potentially contaminated groundwater, undertook monitoring of nine (9) wells on 24 November 2025 as per the EPL monitoring requirements. The scope of work included:

- Field screening of volatile hydrocarbon vapours in the air space around each well and in the well head space using a photoionisation detector (PID).
  - It is noted that none of the wells have a gas sampling cap and as such field screening the air space around the wells was undertaken prior to removing the groundwater well cap. Screening of the well headspace was then carried out immediately after cap removal by inserting the PID probe directly into the well headspace. The field screening readings are indicative, noting that there was likely to be some loss of volatiles during the well cap removal process such that the PID readings may not be fully representative of the volatile hydrocarbon vapours within the well head space.

- Dipping of all accessible wells to measure the depth to the groundwater and presence of any phase separated light non-aqueous phase liquid (LNAPL). No assessment for phase separated dense non-aqueous phase liquid (DNAPL) was undertaken.
  - MW5 could not be located due to being under cover pavement or a container and MW8 was excluded from the scope.
- Placement of a low flow pump into the well and purging until pH and electrical conductivity (EC) readings stabilised. A new bladder and the existing designated tubing were used for each well during the water sample collection with the low flow pump. It is noted that the groundwater within MW1 was lowered during the purging and sampling process, and the recharging of groundwater was very slow.
- Following the stabilisation of pH and EC readings, additional field readings of turbidity, dissolved oxygen, temperature and salinity were recorded, and a sample was collected into laboratory prepared bottles and then placed into an insulated container on ice.
  - Due to the low flow pump becoming lodged in MW10 during purging, samples from MW10 and MW4 were collected using a hand bailer.
  - Samples were 0.45µm filtered prior to preservation for metals analysis.
- The samples were transported to the NATA accredited analytical laboratory and analysed for a suite of chemicals which included benzene, toluene, ethylbenzene, xylene, naphthalene (BTEXN), total recoverable hydrocarbons (TRH), polycyclic aromatic hydrocarbons (PAH), metals (arsenic, cadmium, chromium, copper, nickel, lead, zinc, mercury), ammonia and oxidisable nitrogen.

The relevant calibration sheet for the water quality meter and field sheets are attached in **Appendix B**.

The PID readings at all wells were 0.0 ppm with the exception of MW3 (1 ppm) and MW4 (32.2 ppm), generally consistent with previous findings.

Groundwater was measured to be at between 0.0 m (i.e., at ground surface) at MW10 and 1.76 m below the surface at MW1.

Visual or olfactory indications of hydrocarbon contamination were identified at MW4 only during sampling. LNAPL was identified in MW4 during gauging and sampling.

Due to the use of designated tubing and bladders with the low flow pump, decontamination of the sampling equipment involved rinsing the pump housing, interface dip meter, and water quality meter (Horiba) with biodegradable detergent followed by potable water and distilled water after each sample. No decontamination of the hand bailer was undertaken however, based on the absence of any indications of, and requirements to sample for hydrocarbons at MW10, this is not considered to pose a risk of cross contamination at MW4.

## 4 QUALITY ASSURANCE / QUALITY CONTROL

RCA has reviewed the quality assurance and control in **Appendix C** and assessed the data as follows:

- Accuracy
  - The accuracy of the data has been assessed by internal means (surrogates, laboratory control samples, matrix spikes and method blanks) as being generally acceptable. There were minor non-compliances that were not considered significant to the characterisation of the water quality. Some results were considered to represent the potential for under-estimation of the TRH and PAH results however these are not considered significant within the regular monitoring programme.
  - The accuracy of the data has not been assessed by external means due to the extent of the scope.

As such the accuracy of the data set is considered acceptable to the extent it was assessed.

- Precision
  - The precision of the data has been assessed by internal means (duplicates) as being generally acceptable.
  - The precision of the data has been assessed by external means (intralaboratory duplicates) as being generally acceptable. One result indicated potential uncertainty however as it was considered to be conservative, no data substitution has been undertaken.

As such the precision of the data set is considered acceptable.

- Completeness
  - All data that was sought during the investigation was able to be retrieved.
  - Chain of custody were completed for all samples.
- As such, completeness is considered 100% for the collected samples.
- Representativeness
  - This assessment has considered groundwater contaminant concentrations on-site. The method of sampling for the majority of the wells was appropriate for the sampling of volatile compounds within water for the majority of wells.
    - The use of the hand bailer to sample MW10 and MW4, due to the failure of the low flow pump apparatus, may have resulted in the loss of volatile hydrocarbons and caused the inclusion of sediment in the MW4 sample. Based on the detected concentrations it is not considered that the impact was significant.
    - MW10 was not sampled for volatile hydrocarbons; metals samples were collected and filtered. It is therefore not considered that the sampling methodology had a significant impact on the MW10 results.

As such the groundwater data is considered representative of the concentrations at the site.

- Comparability
  - Works were undertaken by personnel experienced in the sampling of potentially contaminated groundwater. The methodology of the majority of groundwater sampling is consistent with the majority, and the most recent, groundwater sampling techniques.

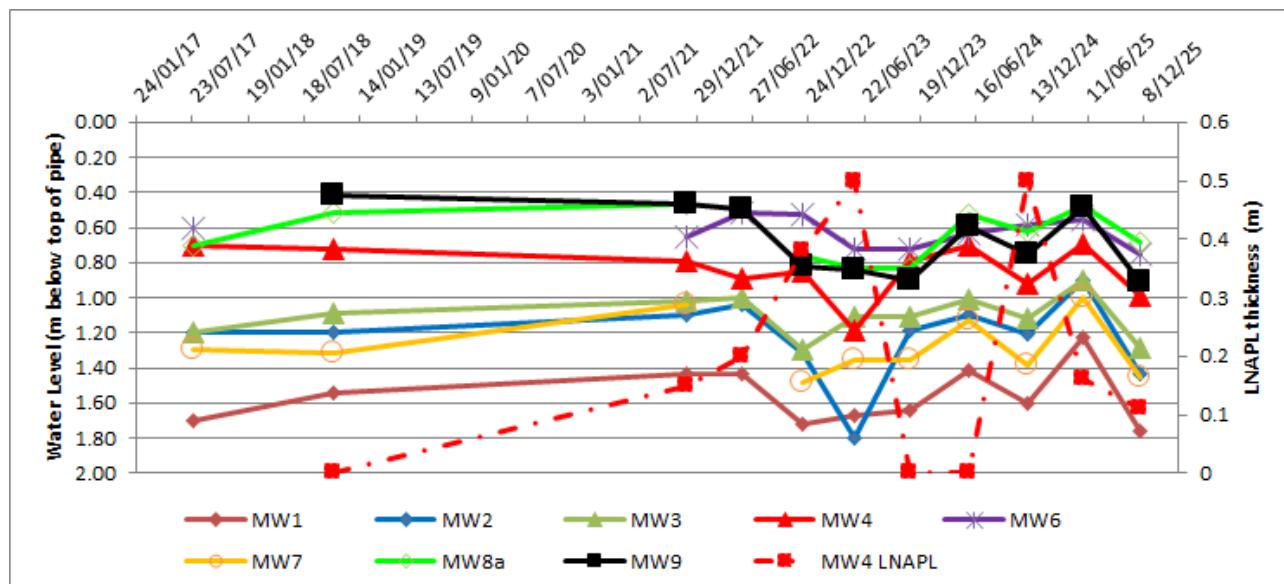
- All samples were appropriately preserved for the requested analysis, and all groundwater samples were kept on ice between sampling and analysis.
- All laboratory analyses have been conducted by NATA accredited methodologies that comply with the international standard methods.
- Comparable analytes show some concurrence between analytical results. The detected concentrations show some concurrence with field observations of the presence of contamination.

It is therefore considered that the data obtained from this testing is generally accurate and adequately reliable in as far as it can be ascertained with regards to the chemical assessment.

## 5 RESULTS

Groundwater results from this sampling round were compared to the relevant criteria in **Appendix D**; the following presents a summary.

Groundwater depths of monitoring wells since 2017 were shown in **Figure 1** below. The groundwater monitoring well MW10 has remained as 0.0 m (at ground level) since the December 2021 monitoring round. Groundwater depths for all the remaining wells generally decreased since the previous round in May 2025.



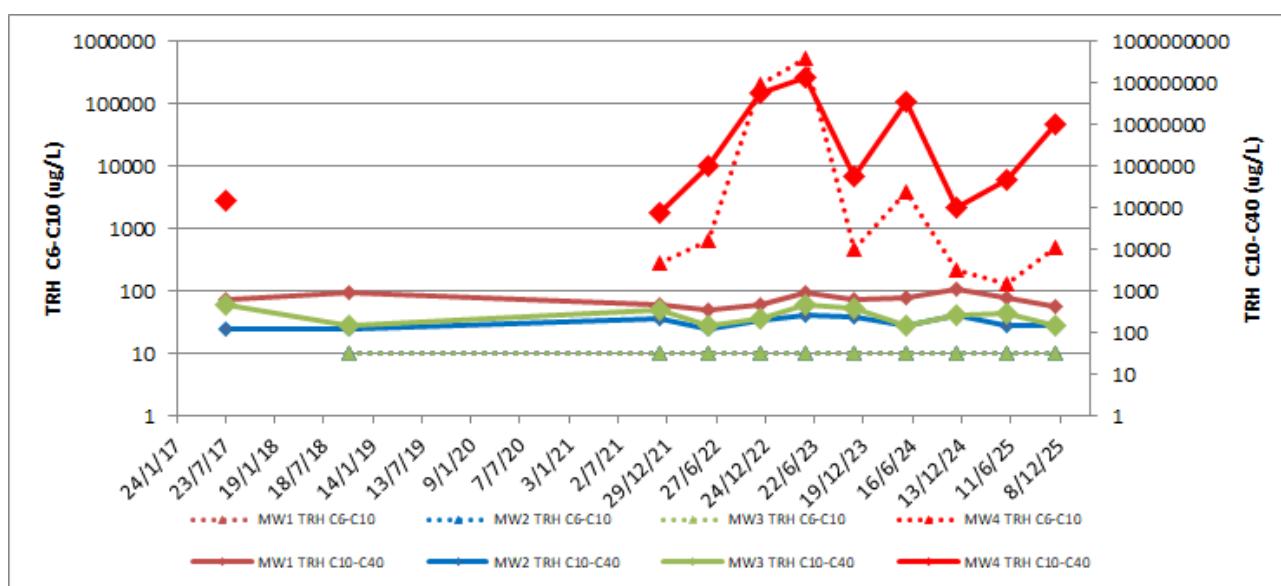
**Figure 1** *Groundwater levels 2017-2025.*

Groundwater contours were generated from the water levels using surveyed data for the wells and indicate a westerly flow direction as presented on **Drawing 1, Appendix A**. It is noted that RCA have excluded MW10 based on the understanding that it is representative of a different aquifer and have used the ground level of MW1, MW2 and MW3 due to suspected changes in the height of the pipes above the ground since the survey. The flow direction is consistent since November 2023.

With regards to chemical concentrations:

- pH ranged from 6.27 at MW4 to 6.43 at MW1. The pH at MW10 was within the range of the other wells, which is not generally the case.

- Electrical conductivity ranged from 0.84 mS/cm at MW1 to 8.01 mS/cm at MW3 and was 17.8 mS/cm at MW10.
- BTEX were not detected in monitoring wells MW1, MW2, MW3 or MW4 and as such concentrations were below the ecological (Ref [3]) and the drinking water criteria (Ref [4]). The results are generally consistent with historical results with exception of MW4 well in which benzene and xylene have previously been identified, although not since May 2024.
- TRH was detected in monitoring wells MW1 and MW4 and as such were in excess of the ecological criterion (Ref [3]). The results of MW4 represented an increase of 1899%, while results at MW1 represented a decrease of 40%. No TRH was found in MW2 and MW3. All results are within the historical data ranges (refer to **Figure 2** below).



**Figure 2** TRH Concentrations 2017-2025 (noting that 2017 data do not include TRH C<sub>6</sub>-C<sub>10</sub> and that MW1, MW2 and MW3 TRH C<sub>6</sub>-C<sub>10</sub> has not been detected such that all data is represented by the MW3 series).

- PAH compounds were not detected in any wells except for MW4 during this monitoring round. Phenanthrene and naphthalene concentrations at MW4 exceeded the ecological criteria. Furthermore, anthracene, benzo(a)pyrene and fluoranthene in this well were inferred to be in excess of the ecological criteria, although cannot be distinctly quantified due to the raised detection limit. Where quantifiable, the November 2025 results showed increases more than 75 times for naphthalene, 40 times for fluorene and for phenanthrene (a bioaccumulative compound) and 25 times for pyrene compared to the May 2025 results.  
No anthracene or benzo(a)pyrene was detected in MW1, MW2 or MW3 however the detection limits of these compounds were in excess of the ecological criterion and drinking water criterion respectively.
- Metals were detected in all five (5) monitored wells (MW1, MW2, MW3, MW4 and MW10) with the type and concentration of metals varying between wells with the exception of copper and mercury which were not detected in any well:
  - Arsenic was detected in MW2, MW3, MW4 and MW10; all concentrations were below the ecological and drinking water criteria and are within the historical ranges.
  - Cadmium was detected only in MW10; the concentration was below the ecological criterion and the drinking water criterion and is within the historical range.

- Chromium was detected only in MW4; the concentration was in excess of the hexavalent chromium ecological criterion and less than the drinking water criterion. The concentration marginally increased when compared to the May 2025 monitoring result and is the highest in the historical range.
- Lead was detected in MW4 and MW10; both concentrations were below the ecological and drinking water criteria and are within the historical ranges.
- Nickel was detected in all five (5) analysed wells at varying levels; the concentrations were in excess of the ecological criterion at MW2, MW3 and MW10. The concentrations at MW1, MW4 and MW10 decreased, and increased at MW2 and MW3, when compared to the May 2025 monitoring results. All concentrations are within the historical ranges.
- Zinc was detected in all five (5) analysed wells at varying levels; the concentrations were in excess of the ecological criterion at all wells. The concentrations decreased at MW1 and MW10, and increased at MW2, MW3 and MW4 when compared to the May 2025 monitoring results. All concentrations are within the historical ranges.
- Ammonia was detected in all wells as presented in **Figure 3**; RCA have assigned the criterion based on the pH of the water and temperature of approximately 20°C at each location during this monitoring round as per **Table 2** below. The MW2 and MW6 concentrations were in excess of the relevant criterion.

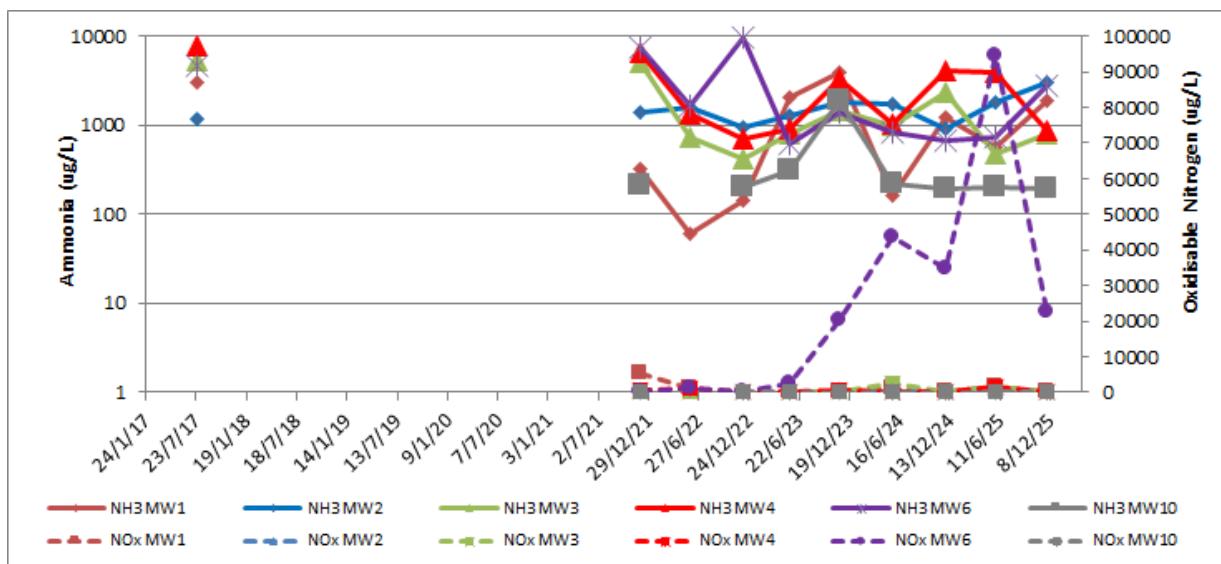
**Table 2** *Ammonia Criterion<sup>1</sup> based on pH and at 20°C*

Sampling Location	Measured pH	pH on which Ammonia Criterion based	Ammonia Criterion (Fresh Water)
MW1	6.43	6.5	2460
MW2	6.34	6.3	2520
MW3	6.40	6.4	2490
MW4	6.27	6.3	2520
MW6	6.32	6.3	2520
MW10	6.38	6.4	2490

- The concentrations increased at MW1, MW2, MW3 and MW6 from a range of 66% (MW2) to 284% (MW6) and decreased at MW4 and MW10 (78% and 5% respectively), when compared to those from May 2025 monitoring round. All results are within the historical ranges with the exception of the MW2 result, which is the highest in the historical range.
- It is noted that there is a draft technical brief regarding ammonia such that the future criteria may be significantly (by a factor of ten) decreased at the pH generally encountered within the groundwater.
- Oxidisable nitrogen (nitrate + nitrite) was detected in all wells with exception of MW4; the concentrations were in excess of the ecological criterion in MW1, MW2, MW6 and MW10. All concentrations are within the historical ranges.

Ammonia and oxidisable nitrogen data are presented in **Figure 3** below.

<sup>1</sup> <https://www.waterquality.gov.au/anz-guidelines/guideline-values/default/water-quality-toxicants/toxicants/ammonia-2000>



**Figure 3 Ammonia and Oxidisable Nitrogen Concentrations 2017-2025.**

## 6 DISCUSSION

Based on the results it is considered that groundwater is impacted by:

- Hydrocarbons in the immediate vicinity of the petroleum infrastructure and historical spill, particularly MW4 which is in close proximity (<5 m) from the refuelling area and associated bowser.
- Ammonia and oxidisable nitrogen in the northern part of the site, except for ammonia at MW10.

A historical surface hydrocarbon spill occurred at the site and MW1, MW2 and MW3 were installed as part of remediation / validation works. While hydrocarbons have been detected in one (1) of these wells, the concentrations are minor compared to those detected in MW4. The contamination is considered to be indicative of a diesel product however no specific identification analysis has been undertaken. The cause of the significant increase in the hydrocarbon concentrations at MW4 is unknown in the absence of any known leak of the site's current petroleum facilities.

The highest ammonia concentration is at MW2, considered the upgradient of the sampled wells based on the inferred groundwater flow (refer **Drawing 1, Appendix A**) indicated that an offsite source of ammonia is possible, noting that there is significant variation within the aquifer. The receiving water is considered likely to be the Hunter River however groundwater may first discharge into the wetland area to the north and west of the site or into one of the unnamed creeks to the northwest and southwest.

The highest concentration of oxidisable nitrogen was recorded at the downgradient well (MW6), with levels approximately four (4) magnitude higher than those observed at the other wells (MW1, MW2, MW3, and MW4) within the same aquifer. As such it is inferred that there may be a localised condition at the location of MW6 which is the cause of the high concentrations. It is noted that MW6 is located in a parking area designed for trucks used in the transportation of ammonium nitrate. Ammonium nitrate is stored at the site however current practices are such that unless there is an accident that results in the breakage of a bulk bag there should not be any product leakage to the ground.

The metals concentrations in the groundwater are in excess of the ecological criteria, however in the absence of any specific source of metals except potentially lead in association with the petroleum contamination, it is not considered that the site is the likely source of the detected metals. Nickel and zinc are the only metals considered to represent a potential risk to the environment. No further action is considered to be necessary with regards to metals concentrations unless concentrations indicate a potential source of contamination at the site.

## 7 CONCLUSIONS

This report has presented the findings of groundwater monitoring undertaken at the Toll site situated in Tomago which is currently used for storage of bulk ammonium nitrate as well as storage and maintenance of the heavy vehicle fleet.

A total of six (6) groundwater monitoring wells were sampled and chemically analysed in November 2025 in accordance with the EPL requirements. The collected samples were analysed for hydrocarbons, metals and nitrogen compounds including ammonia, in general accordance with the EPL.

A layer of LNAPL with an approximate thickness of 0.11 m was identified at MW4 during field gauging and sampling, and dissolved hydrocarbon concentrations had significantly increased compared to the results from May 2025. Hydrocarbon contamination at MW1 decreased by 38%, and it was non-detected at MW2 and MW3.

Ammonia was detected at all wells; in excess of the pH-based ecological guidelines (Ref [3]) presented in **Table 2** at MW2 and MW6. Oxidisable nitrogen was detected in five (5) wells and in excess of the guidelines at MW1, MW2, MW6 and MW10. The source is considered to be historical use of the site, given that current site practices appear to be suitable for the minimisation of potential ammonia contamination from the storage of ammonium nitrate at the site, however the magnitude of the oxidisable nitrogen at MW6 is considered to indicate a localised impact which may or may not be associated with the use of the site. It is noted that the NSW EPA is satisfied with Toll's 'debagging procedure' and has incorporated its implementation to the existing EPL.

Concentrations of three (3) metals were in excess of the ecological guidelines (Ref [3]): chromium at MW4, nickel at MW2, MW3 and MW10, and zinc at all wells. The site is not considered the source of these exceedances due to the absence of any known metal-contaminating activities.

The next groundwater monitoring event will be required in accordance with the EPL and as such will be undertaken in May 2026. Additional works as outlined in the SAQP (Ref [1] as updated) may be undertaken.

## 8 LIMITATIONS

This report has been prepared for Toll Group in accordance with an agreement with RCA Australia (RCA). The services performed by RCA have been conducted in a manner consistent with that generally exercised by members of its profession and consulting practice.

This report has been prepared for the sole use of Toll Group. The report may not contain sufficient information for purposes of other uses or for parties other than Toll Group. This report shall only be presented in full and may not be used to support objectives other than those stated in the report without written permission from RCA Australia.

The information in this report is considered accurate at the date of issue with regard to the current conditions of the site. Conditions can vary across any site that cannot be explicitly defined by investigation. Environmental conditions including contaminant concentrations can change in a limited period of time. This should be considered if the report is used following a significant period of time after the date of issue.

Yours faithfully

**RCA AUSTRALIA**



Muhammad Hayyat  
Environmental Engineer  
BEng, MEng (Env)

## REFERENCES

- [1] RCA Australia, *Sampling and Analysis Quality Plan for Further Groundwater Assessment Works, Toll Tomago Site*, RCA ref 12513d-410/1, July 2024.
- [2] Port Stephens Council, *Port Stephens Local Environment Plan 2013 under the Environmental Planning and Assessment Act 1979* as updated 22 March 2024.
- [3] ANZG, *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* Australian and New Zealand Governments and Australian State and Territory Governments, Canberra ACT, Australia, August 2018. Available at [www.waterquality.gov.au/anz-guidelines](http://www.waterquality.gov.au/anz-guidelines).
- [4] National Health and Medical Research Council, *Australian Drinking Water Guidelines*, December 2024.
- [5] Standards Australia, *Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds*, AS 4482.1-2005.
- [6] NEPC, *National Environment Protection (Assessment of Site Contamination) Measure*, 1999 as amended 2013.

## GLOSSARY

ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure.
Intralaboratory	A sample split into two and sent blind to the sample laboratory for comparative analysis.
kg	kilogram, 1000 gram.
LEP	Local environment plan. A planning tool for the Local Government.
µg	microgram, 1/1000 milligram.
mg	milligram, 1/1000 gram.
NAPL	Non-aqueous phase liquid. This can be lighter than water (LNAPL), or more dense than water (DNAPL).
NEPC	National Environment Protection Council.
NHMRC	National Health and Medical Research Council.
NSW EPA	NSW Environment Protection Authority – made a separate entity in 2011 to regulate the contaminated land industry.
PID	Photoionisation detector. Measures volatile gases in air or emanating from soil or water.
PQL	Practical Quantitation Limit.
QA	Quality Assurance.
QC	Quality Control.
RPD	Relative Percentage Difference.

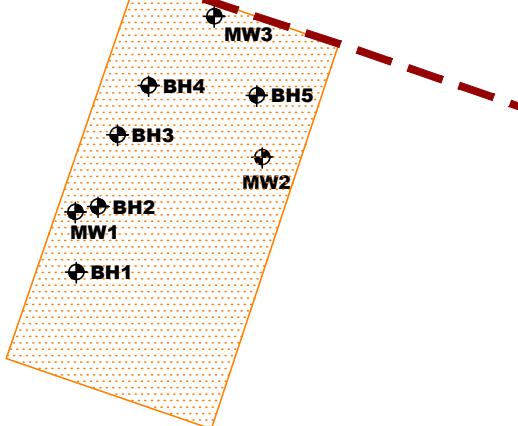
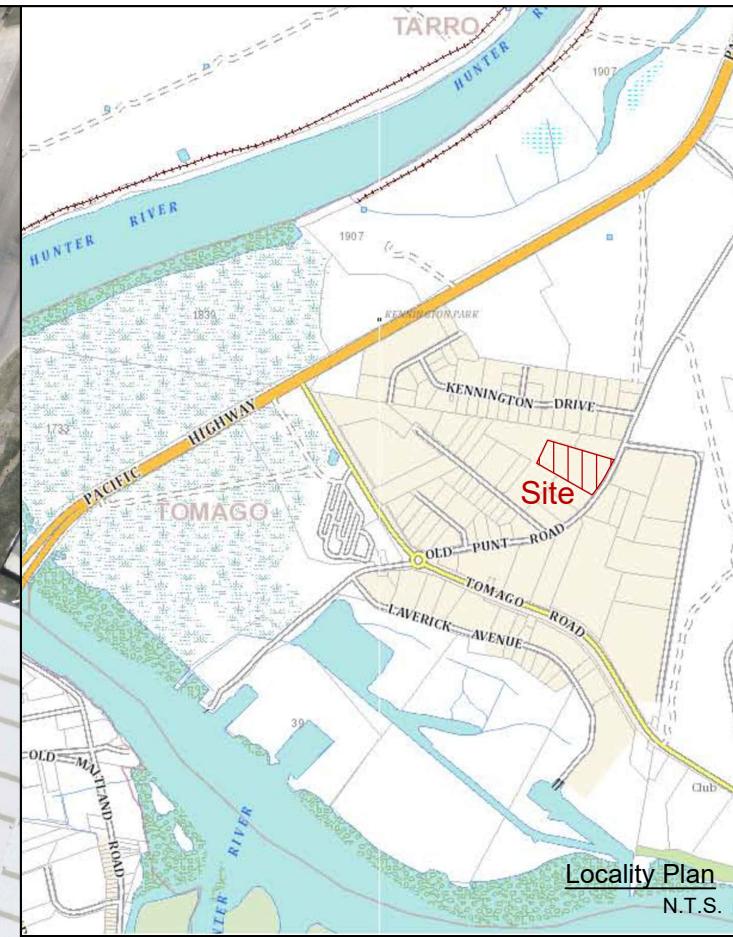
### Chemical Compounds

BTEX	Benzene, toluene, ethylbenzene, xylene. Monocyclic (single ring) aromatic hydrocarbon compounds which are highly soluble in water, volatile and hazardous to health. Occur naturally in crude oil, gas emissions from volcanoes and forest fires. Widely used in industrial and commercial applications. Present in emissions from motor vehicles and aircrafts, cigarette smoke, processing of petroleum products, and during the production of numerous goods.
Naphthalene	Simplest polycyclic (double ring) aromatic hydrocarbon. Analysis is included with BTEX and as part of the PAH suite and the results are used in comparison to different criteria.
PAH	Polycyclic aromatic hydrocarbons. Multi-ring compounds, persistent and carcinogenic found in fuels, oils and creosote. These are also common combustion products.
TRH / TPH	Total recoverable / petroleum hydrocarbons. Mixture of (typically) straight chain chemicals mainly comprising hydrocarbon and carbons found in compounds sourced from crude oil. Fractions are based on behaviour in soil / water and contain many individual chemicals.

# Appendix A

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Drawing



Detail 1

LEGEND

- Approximate location of site boundary
- Approximate location of historical diesel spill
- Approximate groundwater monitoring well location (2018)
- Approximate groundwater monitoring well location (RCA Report 12513-203/1, August 8 2017)
- Inferred groundwater contours (MW1-4, MW6, MW7, MW8a, MW9 only)
- ← Inferred groundwater direction

● Approximate soil borehole and/or groundwater monitoring well location (previous investigation GEOTSGTE20230AA)

— Inferred groundwater direction

Aerial image taken from Nearmap, 7 February 2025  
(Used in accordance with commercial licence)

Note: Storage/parking areas slightly  
different than observed

0 10 20 30 40 50  
metres



**SITE LOCALITY AND LAYOUT PLAN  
GROUNDWATER MONITORING  
12 OLD PUNT ROAD  
TOMAGO**

CLIENT	Toll Group	RCA Ref	12513e-228/0
DRAWN BY	MH	SCALE	~1 : 1000 (A3)
APPROVED BY	FB	DATE	10/12/2025
		DRAWING No	1
		REV	0
		OFFICE	NEWCASTLE

# Appendix B

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## Calibration Record and Field Sheets

# SERVICE & CALIBRATION REPORT

## Water Quality Meter

**Customer Details:**

RCA  
92 Hill St  
Carrington, NSW 2294  
Attn: Stuart King - 0412 686 411

**Job Number**

250729

**Date**

14/07/2025

**Instrument Model:**

HORIBA U-52/10m  
Multi-Parameter Water Quality Meter

**Instrument Serial Number:**

1PH7HSWB Oct 2019

**Fault Report**

Requires service/calibration.

**Repairs Carried Out**

Replaced pH Glass Electrode - 1 year old, replaced under warranty

Replaced DO membrane and replaced filling soln in the pH reference electrode. Cleaned all sensors (dirty) and re-calibrated all sensors as follows:

**Calibration (in accordance with manufacturer's specifications):**

Parameter - unit	Before Calibration	Calibration Value	After calibration	Comment
pH (pH)	7.16	7.01	7.01	Pass
pH (pH)	3.69	4.00	4.00	Pass
ORP (mV)	217	225	225	Pass
Conductivity (mS/cm)	0.000	0.000	0.000	Pass
Conductivity (mS/cm)	0.703	0.718	0.718	Pass
Conductivity (mS/cm)	6.31	6.67	6.67	Pass
Conductivity (mS/cm)	56.6	58.6	58.6	Pass
Turbidity (NTU)	6.4	0.0	0.0	Pass
Turbidity (NTU)	18.3	8.0	8.0	Pass
Turbidity (NTU)	73.8	80.0	80.0	Pass
Turbidity (NTU)	307	400	400	Pass
D.O. zero (mg/L)	0.00	0.00	0.00	Pass
D.O. span (mg/L)	9.73mg/L @17.1°C	9.98mg/L @17.1°C	9.98mg/L @17.1°C	Pass
Temperature (°C)	16.10°C	15.9°C	15.9°C	Pass

**Sensors:**

pH Glass Electrode	pH Ref Electrode	ORP Electrode	DO Electrode
345078	WVH0D0YT	NH00S3C6	X3H6LF5A
NEW - 503192			

**Comments:**

MAKE SURE the pH reference electrode is refilled with soln #330 regularly. If the #330 soln solidifies inside the pH reference electrode, remove the liquid junction cap (flat black rubber cap with wick in the middle) and rinse out the old solution with distilled water. Then refill with fresh HORIBA soln # 330 and refit the liquid junction cap. If the wick becomes dirty, push it through from the bottom of the cap, and cut 1mm off with a sharp blade. Please read the notes on pH maintenance.

**Calibration carried out by:**

Oakie Humphries

**AUSTRALIAN SCIENTIFIC PTY LTD**

**11 McDougall Street, Kotara, NSW, 2289**

**TEL: 1800 021 083**

**E-mail: sales@austscientific.com.au**

**www.austscientific.com.au**

## Calibration and Service Report – PID

**Company:** RCA Australia  
**Contact:** Fiona Brooker  
**Address:** Robert Carr & Associates P/L  
 PO Box 175  
 CARRINGTON  
**Phone:** 02 4902 9225  
**Fax:** 02 4902 9299  
**Email:** [fionab@rca.com.au](mailto:fionab@rca.com.au)

**Manufacturer:** RAE  
**Instrument:** MINIRAE LITE SN: 590-000760  
**Model:** MINIRAE LITE  
**Configuration:** VOC 10.6EV  
**Wireless:** -  
**Network ID:** -  
**Unit ID:** -  
**Details:**  
**Serial #:** **590-000760**  
**Asset #:**  
**Part #:** 059-A110-000  
**Sold:** 26.05.2009  
**Last Cal:** 16.04.2025  
**Job #:** **180070**  
**Cal Spec:**  
**Order #:** PO40001595

Item	Test	Pass/Fail	Comments	Serial Number
Battery	NiCd, NiMH, Dry cell, Lilon	P		
Charger	Power Supply	P		
	Cradle, Travel Charger	P		
Pump	Flow	P	>450ml/min	
Filter	Filter, fitting, etc	P	Replaced	
Alarms	Audible, visual, vibration	P		
Display	Operation	P		
Switches	Operation	P		
PCB	Operation	P		
Connectors	Condition	P		
Firmware	Version	P	V2.22A (Fumigation)	
Datalogger	Operation	P		
Monitor Housing	Condition	P	Cleaned	
Case	Condition / Type	-		
Sensors				
PID	Lamp	P	Cleaned	
PID	Sensor	P	Cleaned	
THP	Sensor	P		

### Engineer's Report

Cleaned lamp, lamp housing and sensor electrode  
 Checked moisture sensitivity  
 Checked flowrate and stall values  
 Checked unit settings and PC configuration  
 Unit serviced and calibrated.

## Calibration and Service Report – PID

**Company:** RCA Australia  
**Contact:** Fiona Brooker  
**Address:** Robert Carr & Associates P/L  
 PO Box 175  
 CARRINGTON  
**Phone:** 02 4902 9225  
**Fax:** 02 4902 9299  
**Email:** [fionab@rca.com.au](mailto:fionab@rca.com.au)

**Manufacturer:** RAE  
**Instrument:** MINIRAE LITE SN: 590-000760  
**Model:** MINIRAE LITE  
**Configuration:** VOC 10.6EV  
**Wireless:** -  
**Network ID:** -  
**Unit ID:** -  
**Details:**  
**Serial #:** **590-000760**  
**Asset #:**  
**Part #:** 059-A110-000  
**Sold:** 26.05.2009  
**Last Cal:** 16.04.2025  
**Job #:** **180070**  
**Cal Spec:**  
**Order #:** PO40001595

### Calibration Certificate

Sensor	Type	Serial No.	Span Gas	Concentration	Traceability Lot #	CF	Reading	
							Zero	Span
Oxygen								
LEL								
PID	050-0000-004. 10.6EV 1/2 INCH LAMP	S023040020M3/106J8205 39	Isobutylene	100ppm	WO443753-1		0	100.0
Battery	059-3053-000, MINIRAE LITE RECHARGEABLE	167J4W0210						
Toxic 1								
Toxic 2								
Toxic 3								
Toxic 4								
Toxic 5								
Toxic 6								

Calibrated/Repaired by: JERRY JI

Date: 16.04.2025

Next Due: 16.10.2025

## ENGINEERING FIELD SHEET

### WATER GAUGING RECORD

CLIENT: Toll Group  
 PROJECT: Groundwater Monitoring Programme  
 LOCATION: Toll Tomago Site

DATE: 29-11-2025  
 PROJECT No: 12513e  
 CLIENT REF:

BORE OR LOCATION ID: MW1	
TIME: <u>9:25 Am</u>	TO <u>9:39</u>
BORE DEPTH: <u>3.21</u> (m TOP)	HEIGHT ABOVE GROUND LEVEL: <u>0.77m</u> (Branch Pipe)
DEPTH TO LNAPL: <u>1.76 - 0.77 = 0.99m</u>	PID SURFACE (ppm): <u>NA</u>
DEPTH TO AQUIFER: <u>1.93 - 0.6 = 0.82m</u>	PID IN WELL (ppm): <u>NA</u>
BORE OR LOCATION ID: MW2	
TIME: <u>9:48 Am</u>	TO <u>9:53 Am</u>
BORE DEPTH: <u>2.87</u> (m TOP)	HEIGHT ABOVE GROUND LEVEL: <u>0.61</u>
DEPTH TO LNAPL: <u>NA</u>	PID SURFACE (ppm): <u>0.0</u>
DEPTH TO AQUIFER: <u>1.29 - 0.47 = 0.82m</u>	PID IN WELL (ppm): <u>0.0</u>
BORE OR LOCATION ID: MW3	
TIME: <u>9:41 Am</u>	TO <u>9:48</u>
BORE DEPTH: <u>3.70 m</u> (m TOP)	HEIGHT ABOVE GROUND LEVEL: <u>0.47</u>
DEPTH TO LNAPL: <u>NA</u>	PID SURFACE (ppm): <u>0.0</u>
DEPTH TO AQUIFER: <u>1.29 - 0.47 = 0.82m</u>	PID IN WELL (ppm): <u>1</u>
BORE OR LOCATION ID: MW4	
TIME: <u>9:48 Am</u>	TO <u>11:07 Am</u>
BORE DEPTH: <u> </u> (m GL)	HEIGHT ABOVE GROUND LEVEL: <u>NA</u>
DEPTH TO LNAPL: <u>0.88 m</u>	PID SURFACE (ppm): <u>0.0</u>
DEPTH TO AQUIFER: <u>0.69m</u>	PID IN WELL (ppm): <u>32.2</u>
BORE OR LOCATION ID: MW5	
TIME: <u> </u>	TO <u> </u>
BORE DEPTH: <u> </u> (m GL)	HEIGHT ABOVE GROUND LEVEL: <u> </u>
DEPTH TO LNAPL: <u> </u>	PID SURFACE (ppm): <u> </u>
DEPTH TO AQUIFER: <u> </u>	PID IN WELL (ppm): <u> </u>

BORE OR LOCATION ID:		MW6		
TIME:	10:45 Am	TO	10:51	(Truck trailer moved)
BORE DEPTH:	3.22	(m GL)	HEIGHT ABOVE GROUND LEVEL:	NA
DEPTH TO LNAPL:	Nill		PID SURFACE (ppm):	0.0
DEPTH TO AQUIFER:	0.75 m		PID IN WELL (ppm):	0.0
BORE OR LOCATION ID:		MW7		
TIME:	10:25 Am	TO	10:37	
BORE DEPTH:	3.05 m	(m GL)	HEIGHT ABOVE GROUND LEVEL:	NA
DEPTH TO LNAPL:	Nill		PID SURFACE (ppm):	0.0
DEPTH TO AQUIFER:	1.45 m		PID IN WELL (ppm):	0.0
BORE OR LOCATION ID:		MW8a		
TIME:	9:10 Am	TO	9:17 Am	
BORE DEPTH:	1.44	(m GL)	HEIGHT ABOVE GROUND LEVEL:	NA
DEPTH TO LNAPL:	Nill		PID SURFACE (ppm):	0.0
DEPTH TO AQUIFER:	0.68 m		PID IN WELL (ppm):	0.0
BORE OR LOCATION ID:		MW9		
TIME:	9:50 Am	TO	10:03	
BORE DEPTH:	2.90	(m GL)	HEIGHT ABOVE GROUND LEVEL:	NA
DEPTH TO LNAPL:	Nill		PID SURFACE (ppm):	0.0
DEPTH TO AQUIFER:	0.91 m		PID IN WELL (ppm):	0.0
BORE OR LOCATION ID:		MW10		
TIME:	10:05 Am	TO	10:15	
BORE DEPTH:	2.19 m	(m GL)	HEIGHT ABOVE GROUND LEVEL:	NA
DEPTH TO LNAPL:	NA		PID SURFACE (ppm):	0.0
DEPTH TO AQUIFER:	at surface		PID IN WELL (ppm):	0.0

## ENGINEERING FIELD SHEET

### WATER SAMPLING RECORD

CLIENT: Toll Group  
 PROJECT: Groundwater Monitoring Programme  
 LOCATION: Toll Tomago Site

DATE: 24-11-2025  
 PROJECT No: 12513e  
 CLIENT REF:

WATER METER USED: *Horiba*  
 METHOD OF SAMPLING: *Low flow pump*  
 PRESERVATION & STORAGE (TICK): Field Temp  Chilled (<4°C)  Frozen   
 Un-preserved  Preserved:  Acid (H<sub>2</sub>SO<sub>4</sub>)  Acid (HNO<sub>3</sub>)  Alkaline (NaOH)  Filtered

TESTS REQUIRED: Refer to Each Location

BORE OR LOCATION ID:		MW1	ANALYSIS NEEDED:		Ammonia, Nitrate, Nitrite, EC, Hydrocarbons, metals					
TIME:		12:10 pm	TO	VOLUME PURGED: 3L						
RESULTS OF WATER QUALITY CHECK										
Check No.	pH	Conductivity (mS/cm)	Turbidity	Dissolved O <sub>2</sub> (mg/L)	Temperature (°C)	Salinity (%)				
1/ +1	6.41	1.49	139	6.09	24.98	0.071				
2/ +1	6.43	0.882	56.7	1.84	24.46	0.042				
3/ +1	6.43	0.865	52.4	1.34	24.28	0.042				
4/										
5/										
6/										

Sample Appearance: *clear, no odour.*

Duplicate/Equipment Wash Identification and Other Remarks:

*After purging, water volume was finished and no water left for sample, collected samples after MW1 and MW2.*

BORE OR LOCATION ID:		MW2	ANALYSIS NEEDED:		Ammonia, Nitrate, Nitrite, EC, Hydrocarbons, metals		
TIME:		12:43 pm	TO	1.20 pm	VOLUME PURGED:		4L
RESULTS OF WATER QUALITY CHECK							
Check No.	pH	Conductivity (mS/cm)	Turbidity	Dissolved O <sub>2</sub> (mg/L)	Temperature (°C)	Salinity (%)	
1/ +1	6.56	9.10	94.7	1.49	24.12	0.513	
2/ +2	6.38	7.68	55.1	4.72	23.50	0.399	
3/ +1	6.34	6.77	51.2	4.21	23.93	0.352	
4/							
5/							
6/							

Sample Appearance: *clear to slightly turbid, no odour.*

Duplicate/Equipment Wash Identification and Other Remarks:

QA

BORE OR LOCATION ID:		MW3	ANALYSIS NEEDED:		Ammonia, Nitrate, Nitrite, EC, Hydrocarbons, metals		
TIME:		1.25 pm	TO	2.00 pm	VOLUME PURGED:		6L
RESULTS OF WATER QUALITY CHECK							
Check No.	pH	Conductivity (mS/cm)	Turbidity	Dissolved O <sub>2</sub> (mg/L)	Temperature (°C)	Salinity (%)	
1/ +1	6.45	7.03	813	8.39	24.16	0.372	
2/ +2	6.43	7.68	784	2.94	22.94	0.428	
3/ +1	6.41	8.34	71000	2.45	22.56	0.454	
4/ +1	6.40	8.01	71000	2.64	22.54	0.436	
5/							
6/							

Sample Appearance: *pale brown, turbid, no odour.*

Duplicate/Equipment Wash Identification and Other Remarks:

RCA Australia	Sampled by:	Mohammed	Date: 29-11-25
---------------	-------------	----------	----------------

BORE OR LOCATION ID:	MW4	ANALYSIS NEEDED:	Ammonia, Nitrate, Nitrite, EC, Hydrocarbons, metals			
TIME:	3:50 pm	TO	VOLUME PURGED:			3L
RESULTS OF WATER QUALITY CHECK				Do not sample if LNAPL present		

Check No.	pH	Conductivity (mS/cm)	Turbidity	Dissolved O <sub>2</sub> (mg/L)	Temperature (°C)	Salinity (%)
1/	6.27	4.40	748	1.72	25.95	0.233
2/						
3/						
4/						
5/						
6/						

Sample Appearance: *dark grey, turbid, oily sheen, hydrocarbon odour*  
 Duplicate/Equipment Wash Identification and Other Remarks:

BORE OR LOCATION ID:	MW6	ANALYSIS NEEDED:	Ammonia, Nitrate, Nitrite, EC.				
TIME:	11:15	TO	12:02 pm	VOLUME PURGED:			5L
RESULTS OF WATER QUALITY CHECK				Do not sample if LNAPL present			

Check No.	pH	Conductivity (mS/cm)	Turbidity	Dissolved O <sub>2</sub> (mg/L)	Temperature (°C)	Salinity (%)
1/ +1	6.26	6.86	994	3.83	22.17	0.360
2/ +2	6.28	5.40	621	2.17	22.69	0.285
3/ +1	6.32	5.99	71000	1.31	22.83	0.331
4/ +1	6.32	6.05	71000	1.32	22.55	0.327
5/						
6/						

Sample Appearance: *Brown, turbid, no odour.*  
 Duplicate/Equipment Wash Identification and Other Remarks:

BORE OR LOCATION ID:	MW10	ANALYSIS NEEDED:	Ammonia, Nitrate, Nitrite, EC, metals				
TIME:	2:40 pm	TO	3:35 pm	VOLUME PURGED:			3L
RESULTS OF WATER QUALITY CHECK				Do not sample if LNAPL present			

Check No.	pH	Conductivity (mS/cm)	Turbidity	Dissolved O <sub>2</sub> (mg/L)	Temperature (°C)	Salinity (%)
1/	6.38	17.8	364	4.91	28.69	1.051
2/						
3/						
4/						
5/						
6/						

Sample Appearance: *Brown, turbid, no odour.*  
 Duplicate/Equipment Wash Identification and Other Remarks:

# Appendix C

---

## Quality Assurance Review and Laboratory Report Sheets

One (1) water intralaboratory duplicate sample was submitted blind to the laboratory for analysis with the batch of samples. This represents a percentage of greater than 10%, in accordance with the frequency recommended for soil samples by the Australian Standard AS 4482.1 (Ref [5]) and RCA protocol.

One trip blank and one trip spike were submitted with the batch of samples by field personnel in accordance with the frequency recommended for soil samples by the Australian Standard AS 4482.1 (Ref [5]) and RCA protocol.

RCA omitted the field blank due to the low potential for cross contamination from the field conditions during the sampling process and the equipment wash due to the low potential for cross contamination from the designated sampling equipment.

Results, as shown further in this **Appendix**, indicate all the water analyses with RPD of less than 30% except for one (1) result:

- MW1/ QA had elevated RPD for zinc. The sample is described as slightly turbid however as samples are filtered prior to preservation for metals analysis, sample heterogeneity is not considered the likely cause of the elevated RPD. There is some uncertainty associated with this sample; however, the sample reported the highest concentration and therefore the uncertainty is considered to be conservative.

There were no detectable concentrations within the trip blank, which are considered acceptable.

Recoveries of 80 to 100% were recorded for the trip spike, which are considered acceptable.

ALS was chosen as the primary laboratory; ALS is NATA accredited and are experienced in the analytical requirements for potentially contaminated groundwater. ALS undertook internal quality assurance testing. Results are contained within the laboratory report sheets, included in this **Appendix**. **Table 3** presents a summary of their review.

**Table 3** Internal Quality Assurance Review

	Number Samples (including QA)	Laboratory Duplicates	Spikes	Laboratory Control Samples	Laboratory Blanks
Requirement	10%	5%	One every batch	One every batch	
<b>Water</b>					
Metals (As, Cd, Cr, Cu, Ni, Pb, Zn)	6	0 (2)	0 (1)	1	1
Mercury	6	1 (1)	0 (1)	1	1
Ammonia	7	1 (1)	0 (1)	1	1
Oxidisable Nitrogen	7	1 (1)	0 (1)	1	1
TRH C <sub>6</sub> -C <sub>10</sub>	6	0 (2)	0 (1)	1	1
TRH >C <sub>10</sub> -C <sub>40</sub>	5	1 (0)	1 (0)	1	1
BTEXN	7	0 (2)	0 (1)	2	1
PAH	5	2 (0)	2 (0)	2	2

Numbers in brackets refer the tests undertaken on samples not from this project but within the same laboratory batch.

Examination of the above table indicates that ALS have undertaken laboratory quality assurance testing in accordance with the ASC NEPM (Ref [6]).

With regards to the results of the quality assurance testing:

- Recoveries of surrogates were within acceptance criteria of 70-130% with the exception of:
  - One (1) of the three (3) PAH surrogates for MW1 and QA1 which was 69% and 68.4% respectively. These are considered minor non-compliance and not significant.
  - PAH surrogates for MW4 which could not be determined. This is considered to be due to the significant PAH and TRH concentrations which are present and not indicative of uncertainty in the PAH results.
  - TRH surrogate for MW4 which had a recovery of 139%. This is considered a minor non-compliance and not significant.

It is noted that phenolic surrogates are reported (due to the concurrent PAH analytical method) and indicate a result below 70%. However, as no phenols analysis was undertaken these results are not considered relevant to the site characterisation.

- Relative percentage differences for duplicates were below the acceptance criterion of 30%.
- No laboratory blank result was detected above the practical quantification limit (PQL).
- Laboratory control spikes recoveries were within acceptance criteria of 70-130% with exception of:
  - Four (4) PAH compounds which had recoveries ranges between 66.4% to 69.2%. These are considered minor non-compliance and are not significant.
  - TRH >C<sub>10</sub>-C<sub>16</sub>, TRH >C<sub>16</sub>-C<sub>34</sub>, and TRH >C<sub>10</sub>-C<sub>16</sub> which had recoveries of 64.4%, 58.8% and 59.3% respectively. Some uncertainty is considered to apply to the TRH results based on the lower of the recoveries.
- Matrix spike recoveries were within the within acceptance criteria of 70-130% with the exception of:
  - The two (2) PAH compounds for which the spike is undertaken (acenaphthene and pyrene) in MW4 were not determined however there were significant concentrations of PAH such that the absence of the recovery of the spiked concentrations (20 µg/L) is not considered to represent an uncertainty. It is noted that the laboratory raised the PQL to account for the potential uncertainty in the sample. There are no criteria for these compounds and as such the uncertainty is not considered significant.
  - TRH C<sub>10</sub>-C<sub>40</sub> in MW4 for which results could not be determined. The detected concentrations were several orders of magnitude above the spiked concentrations (150-350 µg/L) such that the absence of a measurable spike recovery is not considered to represent uncertainty in the result. It is noted that the laboratory raised the PQL to account for the potential uncertainty in the sample.
  - Four (4) PAH compounds in MW2 which had recoveries ranges between 57.1% to 67.8%. Some uncertainty is considered to apply to these results based on the lower of the recoveries however in the absence of detected concentrations it is not considered that the uncertainty is significant.
  - Holding times were within laboratory specified time frames.

Quality Assurance Type	Primary PQL	Intralaboratory Duplicate			RPD %	Trip Blank	Trip Spike	
Sample Identification		MW2	QA	TRIP BLANK		TRIP SPIKE		
Date		24/11/2025				17/11/2025		
Sample Description		Slightly turbid and no odour.				Water	Water	
Sample Purpose		Monitoring				Quality Assurance	Quality Assurance	
Sample Collected by		RCA - MH				Laboratory	Laboratory	
<b>Benzene, Toluene, Ethylbenzene, Xylene (BTEX)</b>								
Benzene	1	0.5	0.5	0.0	<1	90%		
Toluene	2	1	1	0.0	<2	85%		
Ethylbenzene	2	1	1	0.0	<2	80%		
meta- & para-Xylene	2	1	1	0.0	<2	80%		
Ortho-xylene	2	1	1	0.0	<2	85%		
<b>Polycyclic Aromatic Hydrocarbons (PAH)</b>								
Naphthalene	5	2.5	2.5	0.0	<5	100%		
<b>Total Recoverable Hydrocarbons (TRH)</b>								
TRH C <sub>6</sub> -C <sub>10</sub>	20	10	10	0.0	<20	--		
TRH >C <sub>10</sub> -C <sub>16</sub>	100	50	50	0.0	--	--		
TRH >C <sub>16</sub> -C <sub>34</sub>	100	50	50	0.0	--	--		
TRH >C <sub>34</sub> -C <sub>40</sub>	100	50	50	0.0	--	--		
<b>Polycyclic Aromatic Hydrocarbons (PAH)</b>								
Acenaphthene	0.1	0.05	0.05	0.0	--	--		
Acenaphthylene	0.1	0.05	0.05	0.0	--	--		
Anthracene	0.1	0.05	0.05	0.0	--	--		
Benz(a)anthracene	0.1	0.05	0.05	0.0	--	--		
Benzo(a) pyrene	0.05	0.025	0.025	0.0	--	--		
Benzo(b)&(j)fluoranthene	0.1	0.05	0.05	0.0	--	--		
Benzo(g,h,i)perylene	0.1	0.05	0.05	0.0	--	--		
Benzo(k)fluoranthene	0.1	0.05	0.05	0.0	--	--		
Chrysene	0.1	0.05	0.05	0.0	--	--		
Dibenz(a,h)anthracene	0.1	0.05	0.05	0.0	--	--		
Fluoranthene	0.1	0.05	0.05	0.0	--	--		
Fluorene	0.1	0.05	0.05	0.0	--	--		
Indeno(1,2,3-c,d)pyrene	0.1	0.05	0.05	0.0	--	--		
Naphthalene	0.1	0.05	0.05	0.0	--	--		
Phenanthrene	0.1	0.05	0.05	0.0	--	--		
Pyrene	0.1	0.05	0.05	0.0	--	--		
<b>Metals</b>								
Arsenic	1	3	3	0.0	--	--		
Cadmium	0.1	0.05	0.05	0.0	--	--		
Chromium	1	0.5	0.5	0.0	--	--		
Copper	1	0.5	0.5	0.0	--	--		
Lead	1	0.5	0.5	0.0	--	--		
Mercury	0.1	0.05	0.05	0.0	--	--		
Nickel	1	29	30	3.4	--	--		
Zinc	5	60	35	52.6	--	--		
<b>Nutrients</b>								
Ammonia as N	10	3030	2780	8.6	--	--		
Nitrite + Nitrate as N	10	50	50	0.0	--	--		

Note all units in  $\mu\text{g/L}$  except for trip spikes results in % recovery

PQL = Practical Quantitation Limit.

Results underlined were not detected and are reported as half the detection limit for statistical purpose.

**BOLD identifies** where RPD results >30%

**BOLD identifies** where blanks > PQL

**BOLD identifies** where spikes outside of 70-130% recovery range

Toll Group

Groundwater Monitoring

Toll Tomago Site

RCA ref:12513e-228/0, December 2025

Prepared by: MH

Checked by: FB

RCA Australia

AWS-TEM-018/18



## CERTIFICATE OF ANALYSIS

Work Order	: ES2537108	Page	: 1 of 10
Client	: ROBERT CARR & ASSOCIATES P/L	Laboratory	: Environmental Division Sydney
Contact	: MS FIONA BROOKER	Contact	: Danae Hamby
Address	: PO BOX 175 CARRINGTON NSW, AUSTRALIA 2294	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 4902 9200	Telephone	: +61-2-8784 8555
Project	: 12513e	Date Samples Received	: 24-Nov-2025 16:51
Order number	: ----	Date Analysis Commenced	: 25-Nov-2025
C-O-C number	: ----	Issue Date	: 02-Dec-2025 12:50
Sampler	: MH		
Site	: ----		
Quote number	: NSW Custom BQ 2024		
No. of samples received	: 9		
No. of samples analysed	: 9		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW



Accreditation No. 825  
Accredited for compliance with  
ISO/IEC 17025 - Testing

## General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1,2,3,cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EP080: Batch ES2537108-4 result has been confirmed by re-analysis.
- EP075(SIM) : Particular samples required dilution due to sample matrix . LOR values have been adjusted accordingly.Poor matrix spike recovery due to sample heterogeneity. Confirmed by re-extraction and re-analysis.Surrogate recovery bias low due to sample matrix interferences, confirmed by re-analysis.
- EK057G: LOR raised for nitrite due to sample matrix.
- EK059G: LOR raised for NOx due to sample matrix.
- Poor duplicate precision for sample MW4 due to sample heterogeneity. Confirmed by re-extraction and re-analysis.
- EP071: Poor matrix spike recovery for sample MW4 due to sample heterogeneity. Confirmed by re-extraction and re-analysis.
- EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEXN compounds spiked at 20 ug/L.
- EP071: Particular samples required dilution due to sample matrix . LOR values have been adjusted accordingly.
- EP132: Where reported, Total PAH reported as the sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene and Benzo(g,h,i)perylene.



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	MW1	MW2	MW3	MW4	MW6		
Compound	CAS Number	LOR	Unit	Sampling date / time	24-Nov-2025 00:00				
				Result	ES2537108-001	ES2537108-002	ES2537108-003	ES2537108-004	ES2537108-005
				Result	Result	Result	Result	Result	Result
<b>EG020F: Dissolved Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	<0.001	<b>0.003</b>	<b>0.004</b>	<b>0.001</b>	---	---
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	---
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<b>0.003</b>	---	---
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	---
Nickel	7440-02-0	0.001	mg/L	<b>0.002</b>	<b>0.029</b>	<b>0.012</b>	<b>0.001</b>	---	---
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<b>0.002</b>	---	---
Zinc	7440-66-6	0.005	mg/L	<b>0.010</b>	<b>0.060</b>	<b>0.048</b>	<b>0.043</b>	---	---
<b>EG035F: Dissolved Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	---
<b>EK055G: Ammonia as N by Discrete Analyser</b>									
Ammonia as N	7664-41-7	0.01	mg/L	<b>1.90</b>	<b>3.03</b>	<b>0.80</b>	<b>0.87</b>	<b>2.84</b>	---
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	14797-65-0	0.01	mg/L	<b>0.01</b>	<b>0.04</b>	<b>0.02</b>	<0.05	<b>0.12</b>	---
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
Nitrate as N	14797-55-8	0.01	mg/L	<b>0.07</b>	<b>0.01</b>	<0.01	<0.05	<b>22.6</b>	---
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	---	0.01	mg/L	<b>0.08</b>	<b>0.05</b>	<b>0.02</b>	<0.05	<b>22.7</b>	---
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	1.0	µg/L	---	---	---	<b>3600</b>	---	---
Acenaphthylene	208-96-8	1.0	µg/L	---	---	---	<1500	---	---
Acenaphthene	83-32-9	1.0	µg/L	---	---	---	<1500	---	---
Fluorene	86-73-7	1.0	µg/L	---	---	---	<b>10700</b>	---	---
Phenanthrene	85-01-8	1.0	µg/L	---	---	---	<b>16200</b>	---	---
Anthracene	120-12-7	1.0	µg/L	---	---	---	<1500	---	---
Fluoranthene	206-44-0	1.0	µg/L	---	---	---	<1500	---	---
Pyrene	129-00-0	1.0	µg/L	---	---	---	<b>2310</b>	---	---
Benz(a)anthracene	56-55-3	1.0	µg/L	---	---	---	<1500	---	---



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	MW1	MW2	MW3	MW4	MW6	
Compound	CAS Number	LOR	Sampling date / time	24-Nov-2025 00:00				
			Unit	ES2537108-001	ES2537108-002	ES2537108-003	ES2537108-004	ES2537108-005
			Result	Result	Result	Result	Result	Result
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Chrysene	218-01-9	1.0	µg/L	---	---	---	<1500	---
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	---	---	---	<1500	---
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	---	---	---	<1500	---
Benzo(a)pyrene	50-32-8	0.5	µg/L	---	---	---	<1500	---
Indeno(1,2,3,cd)pyrene	193-39-5	1.0	µg/L	---	---	---	<1500	---
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	---	---	---	<1500	---
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	---	---	---	<1500	---
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	µg/L	---	---	---	<b>32800</b>	---
^ Benzo(a)pyrene TEQ (zero)	---	0.5	µg/L	---	---	---	<750	---
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	---	20	µg/L	<20	<20	<20	<b>220</b>	---
C10 - C14 Fraction	---	50	µg/L	<50	<50	<50	<b>2550000</b>	---
C15 - C28 Fraction	---	100	µg/L	<b>320</b>	<100	<100	<b>6980000</b>	---
C29 - C36 Fraction	---	50	µg/L	<50	<50	<50	<9000	---
^ C10 - C36 Fraction (sum)	---	50	µg/L	<b>320</b>	<50	<50	<b>9530000</b>	---
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<b>500</b>	---
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<b>500</b>	---
>C10 - C16 Fraction	---	100	µg/L	<100	<100	<100	<b>5030000</b>	---
>C16 - C34 Fraction	---	100	µg/L	<b>320</b>	<100	<100	<b>4590000</b>	---
>C34 - C40 Fraction	---	100	µg/L	<100	<100	<100	<9000	---
^ >C10 - C40 Fraction (sum)	---	100	µg/L	<b>320</b>	<100	<100	<b>9620000</b>	---
^ >C10 - C16 Fraction minus Naphthalene (F2)	---	100	µg/L	<100	<100	<100	<b>5030000</b>	---
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	---
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	---



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	MW1	MW2	MW3	MW4	MW6	
Compound	CAS Number	LOR	Sampling date / time	24-Nov-2025 00:00				
			Unit	ES2537108-001	ES2537108-002	ES2537108-003	ES2537108-004	ES2537108-005
			Result		Result	Result	Result	Result
<b>EP080: BTEXN - Continued</b>								
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	---
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	---
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	---
^ Total Xylenes	---	2	µg/L	<2	<2	<2	<2	---
^ Sum of BTEX	---	1	µg/L	<1	<1	<1	<1	---
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<b>52</b>	---
<b>EP132B: Polynuclear Aromatic Hydrocarbons</b>								
3-Methylcholanthrene	56-49-5	0.1	µg/L	<0.1	<0.1	<0.1	---	---
2-Methylnaphthalene	91-57-6	0.1	µg/L	<0.1	<0.1	<b>0.2</b>	---	---
7,12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	<0.1	<0.1	<0.1	---	---
Acenaphthene	83-32-9	0.1	µg/L	<0.1	<0.1	<0.1	---	---
Acenaphthylene	208-96-8	0.1	µg/L	<0.1	<0.1	<0.1	---	---
Anthracene	120-12-7	0.1	µg/L	<0.1	<0.1	<0.1	---	---
Benz(a)anthracene	56-55-3	0.1	µg/L	<0.1	<0.1	<0.1	---	---
Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	<0.05	<0.05	---	---
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.1	µg/L	<0.1	<0.1	<0.1	---	---
Benzo(e)pyrene	192-97-2	0.1	µg/L	<0.1	<0.1	<0.1	---	---
Benzo(g.h.i)perylene	191-24-2	0.1	µg/L	<0.1	<0.1	<0.1	---	---
Benzo(k)fluoranthene	207-08-9	0.1	µg/L	<0.1	<0.1	<0.1	---	---
Chrysene	218-01-9	0.1	µg/L	<0.1	<0.1	<0.1	---	---
Coronene	191-07-1	0.1	µg/L	<0.1	<0.1	<0.1	---	---
Dibenz(a,h)anthracene	53-70-3	0.1	µg/L	<0.1	<0.1	<0.1	---	---
Fluoranthene	206-44-0	0.1	µg/L	<0.1	<0.1	<0.1	---	---
Fluorene	86-73-7	0.1	µg/L	<0.1	<0.1	<0.1	---	---
Indeno(1,2,3,cd)pyrene	193-39-5	0.1	µg/L	<0.1	<0.1	<0.1	---	---
Naphthalene	91-20-3	0.1	µg/L	<0.1	<0.1	<0.1	---	---
Perylene	198-55-0	0.1	µg/L	<0.1	<0.1	<0.1	---	---

## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	MW1	MW2	MW3	MW4	MW6	
		Sampling date / time	24-Nov-2025 00:00					
Compound	CAS Number	LOR	Unit	ES2537108-001	ES2537108-002	ES2537108-003	ES2537108-004	ES2537108-005
				Result	Result	Result	Result	Result
<b>EP132B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Phenanthrene	85-01-8	0.1	µg/L	<0.1	<0.1	<0.1	---	---
Pyrene	129-00-0	0.1	µg/L	<0.1	<0.1	<0.1	---	---
^ Sum of PAHs	---	0.05	µg/L	<0.05	<0.05	<0.05	---	---
^ Benzo(a)pyrene TEQ (zero)	---	0.05	µg/L	<0.05	<0.05	<0.05	---	---
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	1.0	%	---	---	---	Not Determined	---
2-Chlorophenol-d4	93951-73-6	1.0	%	---	---	---	Not Determined	---
2,4,6-Tribromophenol	118-79-6	1.0	%	---	---	---	Not Determined	---
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	1.0	%	---	---	---	Not Determined	---
Anthracene-d10	1719-06-8	1.0	%	---	---	---	Not Determined	---
4-Terphenyl-d14	1718-51-0	1.0	%	---	---	---	Not Determined	---
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-d4	17060-07-0	2	%	102	103	103	139	---
Toluene-d8	2037-26-5	2	%	101	105	101	113	---
4-Bromofluorobenzene	460-00-4	2	%	90.3	91.8	84.6	112	---
<b>EP132T: Base/Neutral Extractable Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	69.0	72.6	73.3	---	---
Anthracene-d10	1719-06-8	0.1	%	81.5	83.5	82.1	---	---
4-Terphenyl-d14	1718-51-0	0.1	%	91.6	91.3	89.6	---	---

## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	MW10	QA	TRIP BLANK	TRIP SPIKE	---		
Compound	CAS Number	LOR	Unit	Sampling date / time	24-Nov-2025 00:00	24-Nov-2025 00:00	17-Nov-2025 00:00	17-Nov-2025 00:00	---
				Result	ES2537108-006	ES2537108-007	ES2537108-008	ES2537108-009	-----
<b>EG020F: Dissolved Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	<b>0.002</b>	<b>0.003</b>	---	---	---	---
Cadmium	7440-43-9	0.0001	mg/L	<b>0.0001</b>	<0.0001	---	---	---	---
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	---	---	---	---
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	---	---	---	---
Nickel	7440-02-0	0.001	mg/L	<b>0.160</b>	<b>0.030</b>	---	---	---	---
Lead	7439-92-1	0.001	mg/L	<b>0.001</b>	<0.001	---	---	---	---
Zinc	7440-66-6	0.005	mg/L	<b>0.201</b>	<b>0.035</b>	---	---	---	---
<b>EG035F: Dissolved Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	---	---	---	---
<b>EK055G: Ammonia as N by Discrete Analyser</b>									
Ammonia as N	7664-41-7	0.01	mg/L	<b>0.19</b>	<b>2.78</b>	---	---	---	---
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<b>0.04</b>	---	---	---	---
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
Nitrate as N	14797-55-8	0.01	mg/L	<b>0.08</b>	<b>0.01</b>	---	---	---	---
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	---	0.01	mg/L	<b>0.08</b>	<b>0.05</b>	---	---	---	---
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	---	20	µg/L	---	<20	<20	---	---	---
C10 - C14 Fraction	---	50	µg/L	---	<50	---	---	---	---
C15 - C28 Fraction	---	100	µg/L	---	<100	---	---	---	---
C29 - C36 Fraction	---	50	µg/L	---	<50	---	---	---	---
^ C10 - C36 Fraction (sum)	---	50	µg/L	---	<50	---	---	---	---
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	20	µg/L	---	<20	<20	---	---	---
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	---	<20	<20	---	---	---
>C10 - C16 Fraction	---	100	µg/L	---	<100	---	---	---	---



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	MW10	QA	TRIP BLANK	TRIP SPIKE	---
		Sampling date / time	24-Nov-2025 00:00	24-Nov-2025 00:00	17-Nov-2025 00:00	17-Nov-2025 00:00	---
Compound	CAS Number	LOR	Unit	ES2537108-006	ES2537108-007	ES2537108-008	ES2537108-009
				Result	Result	Result	Result
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued</b>							
>C16 - C34 Fraction	---	100	µg/L	---	<100	---	---
>C34 - C40 Fraction	---	100	µg/L	---	<100	---	---
^ >C10 - C40 Fraction (sum)	---	100	µg/L	---	<100	---	---
^ >C10 - C16 Fraction minus Naphthalene (F2)	---	100	µg/L	---	<100	---	---
<b>EP080: BTEXN</b>							
Benzene	71-43-2	1	µg/L	---	<1	<1	18
Toluene	108-88-3	2	µg/L	---	<2	<2	17
Ethylbenzene	100-41-4	2	µg/L	---	<2	<2	16
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	---	<2	<2	16
ortho-Xylene	95-47-6	2	µg/L	---	<2	<2	17
^ Total Xylenes	---	2	µg/L	---	<2	<2	33
^ Sum of BTEX	---	1	µg/L	---	<1	<1	84
Naphthalene	91-20-3	5	µg/L	---	<5	<5	18
<b>EP132B: Polynuclear Aromatic Hydrocarbons</b>							
3-Methylcholanthrene	56-49-5	0.1	µg/L	---	<0.1	---	---
2-Methylnaphthalene	91-57-6	0.1	µg/L	---	<0.1	---	---
7,12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	---	<0.1	---	---
Acenaphthene	83-32-9	0.1	µg/L	---	<0.1	---	---
Acenaphthylene	208-96-8	0.1	µg/L	---	<0.1	---	---
Anthracene	120-12-7	0.1	µg/L	---	<0.1	---	---
Benz(a)anthracene	56-55-3	0.1	µg/L	---	<0.1	---	---
Benzo(a)pyrene	50-32-8	0.05	µg/L	---	<0.05	---	---
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.1	µg/L	---	<0.1	---	---
Benzo(e)pyrene	192-97-2	0.1	µg/L	---	<0.1	---	---
Benzo(g,h,i)perylene	191-24-2	0.1	µg/L	---	<0.1	---	---
Benzo(k)fluoranthene	207-08-9	0.1	µg/L	---	<0.1	---	---

## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	MW10	QA	TRIP BLANK	TRIP SPIKE	---
		Sampling date / time	24-Nov-2025 00:00	24-Nov-2025 00:00	17-Nov-2025 00:00	17-Nov-2025 00:00	---
Compound	CAS Number	LOR	Unit	ES2537108-006	ES2537108-007	ES2537108-008	ES2537108-009
				Result	Result	Result	Result
<b>EP132B: Polynuclear Aromatic Hydrocarbons - Continued</b>							
Chrysene	218-01-9	0.1	µg/L	---	<0.1	---	---
Coronene	191-07-1	0.1	µg/L	---	<0.1	---	---
Dibenz(a,h)anthracene	53-70-3	0.1	µg/L	---	<0.1	---	---
Fluoranthene	206-44-0	0.1	µg/L	---	<0.1	---	---
Fluorene	86-73-7	0.1	µg/L	---	<0.1	---	---
Indeno(1,2,3,cd)pyrene	193-39-5	0.1	µg/L	---	<0.1	---	---
Naphthalene	91-20-3	0.1	µg/L	---	<0.1	---	---
Perylene	198-55-0	0.1	µg/L	---	<0.1	---	---
Phenanthrene	85-01-8	0.1	µg/L	---	<0.1	---	---
Pyrene	129-00-0	0.1	µg/L	---	<0.1	---	---
^ Sum of PAHs	---	0.05	µg/L	---	<0.05	---	---
^ Benzo(a)pyrene TEQ (zero)	---	0.05	µg/L	---	<0.05	---	---
<b>EP080S: TPH(V)/BTEX Surrogates</b>							
1,2-Dichloroethane-D4	17060-07-0	2	%	---	113	101	96.6
Toluene-D8	2037-26-5	2	%	---	101	98.1	99.7
4-Bromofluorobenzene	460-00-4	2	%	---	87.2	86.2	85.3
<b>EP132T: Base/Neutral Extractable Surrogates</b>							
2-Fluorobiphenyl	321-60-8	0.1	%	---	68.4	---	---
Anthracene-d10	1719-06-8	0.1	%	---	74.6	---	---
4-Terphenyl-d14	1718-51-0	0.1	%	---	81.2	---	---

## Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	72	143
Toluene-D8	2037-26-5	75	131
4-Bromofluorobenzene	460-00-4	73	137
<b>EP132T: Base/Neutral Extractable Surrogates</b>			
2-Fluorobiphenyl	321-60-8	43	135
Anthracene-d10	1719-06-8	48	138
4-Terphenyl-d14	1718-51-0	48	144



## QUALITY CONTROL REPORT

Work Order	: ES2537108	Page	: 1 of 9
Client	: ROBERT CARR & ASSOCIATES P/L	Laboratory	: Environmental Division Sydney
Contact	: MS FIONA BROOKER	Contact	: Danae Hambly
Address	: PO BOX 175 CARRINGTON NSW, AUSTRALIA 2294	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 4902 9200	Telephone	: +61-2-8784 8555
Project	: 12513e	Date Samples Received	: 24-Nov-2025
Order number	: ----	Date Analysis Commenced	: 25-Nov-2025
C-O-C number	: ----	Issue Date	: 02-Dec-2025
Sampler	: MH		
Site	: ----		
Quote number	: NSW Custom BQ 2024		
No. of samples received	: 9		
No. of samples analysed	: 9		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW



Accreditation No. 825  
Accredited for compliance with  
ISO/IEC 17025 - Testing

## General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

RPD = Relative Percentage Difference

# = Indicates failed QC

\* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: WATER

Laboratory Duplicate (DUP) Report									
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
<b>EG020F: Dissolved Metals by ICP-MS (QC Lot: 7034869)</b>									
EN2519819-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.013	0.013	0.0	0% - 50%
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.007	0.006	0.0	No Limit
EN2519910-011	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.014	0.014	0.0	0% - 50%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.006	0.006	0.0	No Limit
<b>EG035F: Dissolved Mercury by FIMS (QC Lot: 7034870)</b>									
EN2519819-005	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2537108-004	MW4	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
<b>EK055G: Ammonia as N by Discrete Analyser (QC Lot: 7038119)</b>									
ES2537108-006	MW10	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.19	0.19	0.0	0% - 50%
EN2519829-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	1.74	1.87	7.3	0% - 20%



Sub-Matrix: WATER			Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
<b>EK057G: Nitrite as N by Discrete Analyser (QC Lot: 7028660)</b>									
EN2519512-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2537124-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 7038120)</b>									
ES2537108-007	QA	EK059G: Nitrite + Nitrate as N	---	0.01	mg/L	0.05	0.05	0.0	No Limit
EN2519829-001	Anonymous	EK059G: Nitrite + Nitrate as N	---	0.01	mg/L	0.08	0.07	0.0	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 7028608)</b>									
ES2537108-004	MW4	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5 (1500)*	µg/L	<1500	<1500	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1 (1500)*	µg/L	3600	3420	4.9	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1 (1500)*	µg/L	<1500	<1500	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1 (1500)*	µg/L	<1500	<1500	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	1 (1500)*	µg/L	10700	10100	6.1	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1 (1500)*	µg/L	16200	15200	6.2	0% - 50%
		EP075(SIM): Anthracene	120-12-7	1 (1500)*	µg/L	<1500	<1500	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1 (1500)*	µg/L	<1500	<1500	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	1 (1500)*	µg/L	2310	2180	5.9	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1 (1500)*	µg/L	<1500	<1500	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1 (1500)*	µg/L	<1500	<1500	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	1 (1500)*	µg/L	<1500	<1500	0.0	No Limit
			205-82-3						
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1 (1500)*	µg/L	<1500	<1500	0.0	No Limit
		EP075(SIM): Indeno(1,2,3,cd)pyrene	193-39-5	1 (1500)*	µg/L	<1500	<1500	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1 (1500)*	µg/L	<1500	<1500	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1 (1500)*	µg/L	<1500	<1500	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 7028607)</b>									
ES2537108-004	MW4	EP071: C15 - C28 Fraction	---	100 (9000)*	µg/L	6980000	7890000	12.2	0% - 20%
		EP071: C10 - C14 Fraction	---	50 (9000)*	µg/L	2550000	2770000	8.3	0% - 20%
		EP071: C29 - C36 Fraction	---	50 (9000)*	µg/L	<9000	13900	43.1	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 7034178)</b>									
EB2541538-001	Anonymous	EP080: C6 - C9 Fraction	---	20	µg/L	<20	<20	0.0	No Limit
ES2536893-008	Anonymous	EP080: C6 - C9 Fraction	---	20	µg/L	<20	<20	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 7028607)</b>									
ES2537108-004	MW4	EP071: >C10 - C16 Fraction	---	100 (9000)*	µg/L	5030000	5460000	8.2	0% - 20%
		EP071: >C16 - C34 Fraction	---	100 (9000)*	µg/L	4590000	5180000	12.3	0% - 20%
		EP071: >C34 - C40 Fraction	---	100 (9000)*	µg/L	<9000	<9000	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 7034178)</b>									
EB2541538-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2536893-008	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit



Sub-Matrix: WATER

			Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
<b>EP080: BTEXN (QC Lot: 7034178)</b>									
EB2541538-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2536893-008	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
<b>EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 7028530)</b>									
ES2537108-001	MW1	EP132: Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP132: 3-Methylcholanthrene	56-49-5	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: 2-Methylnaphthalene	91-57-6	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: 7,12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Acenaphthene	83-32-9	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Acenaphthylene	208-96-8	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Anthracene	120-12-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Benz(a)anthracene	56-55-3	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Benzo(e)pyrene	192-97-2	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Benzo(g.h.i)perylene	191-24-2	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Benzo(k)fluoranthene	207-08-9	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Chrysene	218-01-9	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Coronene	191-07-1	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Dibenz(a,h)anthracene	53-70-3	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Fluoranthene	206-44-0	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Fluorene	86-73-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Indeno(1,2,3,cd)pyrene	193-39-5	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Naphthalene	91-20-3	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Perylene	198-55-0	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Phenanthrene	85-01-8	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Pyrene	129-00-0	0.1	µg/L	<0.1	<0.1	0.0	No Limit

## Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Result	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
							Low	High
<b>EG020F: Dissolved Metals by ICP-MS (QC Lot: 7034869)</b>								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	92.6	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	92.2	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	89.9	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	91.3	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	92.1	83.0	111
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	92.6	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	91.9	81.0	117
<b>EG035F: Dissolved Mercury by FIMS (QC Lot: 7034870)</b>								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	90.8	83.0	105
<b>EK055G: Ammonia as N by Discrete Analyser (QC Lot: 7038119)</b>								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	105	90.0	114
<b>EK057G: Nitrite as N by Discrete Analyser (QC Lot: 7028660)</b>								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	98.6	82.0	114
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 7038120)</b>								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	103	91.0	113
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 7028608)</b>								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	66.8	50.0	94.0
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	91.9	63.6	114
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	94.7	62.2	113
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	92.2	63.9	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	89.9	62.6	116
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	72.4	64.3	116
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	76.8	63.6	118
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	76.4	63.1	118
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	72.3	64.1	117
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	66.4	62.5	116
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	1	µg/L	<1.0	5 µg/L	69.2	61.7	119
EP075(SIM): Benzo(k)fluoranthene	205-82-3	1	µg/L	<1.0	5 µg/L	68.4	63.0	115
EP075(SIM): Benzo(a)pyrene	207-08-9	1	µg/L	<1.0	5 µg/L	98.7	63.3	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	97.7	59.9	118



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Result	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 7028608) - continued</b>								
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	91.9	61.2	117
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	82.8	59.1	118
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 7028607)</b>								
EP071: C10 - C14 Fraction	---	50	µg/L	<50	400 µg/L	63.4	53.7	97.0
EP071: C15 - C28 Fraction	---	100	µg/L	<100	600 µg/L	88.2	63.3	107
EP071: C29 - C36 Fraction	---	50	µg/L	<50	400 µg/L	66.1	58.3	120
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 7034178)</b>								
EP080: C6 - C9 Fraction	---	20	µg/L	<20	260 µg/L	105	75.0	127
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 7028607)</b>								
EP071: >C10 - C16 Fraction	---	100	µg/L	<100	500 µg/L	64.4	53.9	95.5
EP071: >C16 - C34 Fraction	---	100	µg/L	<100	700 µg/L	58.8	57.8	110
EP071: >C34 - C40 Fraction	---	100	µg/L	<100	300 µg/L	59.3	50.5	115
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 7034178)</b>								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	85.2	75.0	127
<b>EP080: BTEXN (QC Lot: 7034178)</b>								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	93.4	68.3	119
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	105	73.5	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	110	73.8	122
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	109	73.0	122
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	108	76.4	123
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	94.4	75.5	124
<b>EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 7028530)</b>								
EP132: 3-Methylcholanthrene	56-49-5	0.1	µg/L	<0.1	2 µg/L	109	60.0	120
EP132: 2-Methylnaphthalene	91-57-6	0.1	µg/L	<0.1	2 µg/L	80.4	59.0	123
EP132: 7,12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	<0.1	2 µg/L	81.6	36.0	144
EP132: Acenaphthene	83-32-9	0.1	µg/L	<0.1	2 µg/L	91.3	64.0	122
EP132: Acenaphthylene	208-96-8	0.1	µg/L	<0.1	2 µg/L	93.0	64.0	126
EP132: Anthracene	120-12-7	0.1	µg/L	<0.1	2 µg/L	94.9	65.0	127
EP132: Benz(a)anthracene	56-55-3	0.1	µg/L	<0.1	2 µg/L	103	64.0	130
EP132: Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	2 µg/L	103	64.0	126
EP132: Benzo(b+j)fluoranthene	205-99-2	0.1	µg/L	<0.1	2 µg/L	108	62.0	126
	205-82-3							
EP132: Benzo(e)pyrene	192-97-2	0.1	µg/L	<0.1	2 µg/L	101	62.0	126
EP132: Benzo(g,h,i)perylene	191-24-2	0.1	µg/L	<0.1	2 µg/L	98.3	56.0	126



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Result	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
<b>EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 7028530) - continued</b>								
EP132: Benzo(k)fluoranthene	207-08-9	0.1	µg/L	<0.1	2 µg/L	98.8	68.0	130
EP132: Chrysene	218-01-9	0.1	µg/L	<0.1	2 µg/L	97.2	66.0	130
EP132: Coronene	191-07-1	0.1	µg/L	<0.1	2 µg/L	95.1	35.0	133
EP132: Dibenz(a,h)anthracene	53-70-3	0.1	µg/L	<0.1	2 µg/L	99.7	58.0	128
EP132: Fluoranthene	206-44-0	0.1	µg/L	<0.1	2 µg/L	104	65.0	127
EP132: Fluorene	86-73-7	0.1	µg/L	<0.1	2 µg/L	95.9	64.0	124
EP132: Indeno(1,2,3-cd)pyrene	193-39-5	0.1	µg/L	<0.1	2 µg/L	101	57.0	127
EP132: Naphthalene	91-20-3	0.1	µg/L	<0.1	2 µg/L	84.0	54.0	128
EP132: Perylene	198-55-0	0.1	µg/L	<0.1	2 µg/L	98.6	66.0	130
EP132: Phenanthrene	85-01-8	0.1	µg/L	<0.1	2 µg/L	95.6	65.0	129
EP132: Pyrene	129-00-0	0.1	µg/L	<0.1	2 µg/L	104	66.0	128

**Matrix Spike (MS) Report**

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: WATER

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Acceptable Limits (%)	
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 7034869)</b>							
EN2519819-004	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	93.5	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	95.4	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	93.8	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	95.4	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	93.9	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	96.6	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	95.8	70.0	130
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 7034870)</b>							
EN2519819-006	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	90.7	70.0	130
<b>EK055G: Ammonia as N by Discrete Analyser (QCLot: 7038119)</b>							
EN2519829-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.5 mg/L	129	70.0	130
<b>EK057G: Nitrite as N by Discrete Analyser (QCLot: 7028660)</b>							
EN2519512-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	94.1	70.0	130
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 7038120)</b>							
EN2519829-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	108	70.0	130



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Spike	Spike Recovery(%)	Acceptable Limits (%)	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 7028608)				Concentration	MS	Low	High
ES2537108-004	MW4	EP075(SIM): Acenaphthene	83-32-9	20 µg/L	# 0.0	70.0	130
		EP075(SIM): Pyrene	129-00-0	20 µg/L	# Not Determined	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 7028607)							
ES2537108-004	MW4	EP071: C10 - C14 Fraction	---	200 µg/L	# Not Determined	70.0	130
		EP071: C15 - C28 Fraction	---	250 µg/L	# Not Determined	71.0	130
		EP071: C29 - C36 Fraction	---	200 µg/L	# Not Determined	67.0	130
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 7034178)							
EB2541538-001	Anonymous	EP080: C6 - C9 Fraction	---	325 µg/L	115	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 7028607)							
ES2537108-004	MW4	EP071: >C10 - C16 Fraction	---	250 µg/L	# Not Determined	70.0	130
		EP071: >C16 - C34 Fraction	---	350 µg/L	# Not Determined	75.0	130
		EP071: >C34 - C40 Fraction	---	150 µg/L	# Not Determined	67.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 7034178)							
EB2541538-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	99.2	70.0	130
EP080: BTEXN (QC Lot: 7034178)							
EB2541538-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	99.7	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	103	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	105	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	101	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	104	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	102	70.0	130
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 7028530)							
ES2537108-002	MW2	EP132: 3-Methylcholanthrene	56-49-5	2 µg/L	82.1	59.0	115
		EP132: 2-Methylnaphthalene	91-57-6	2 µg/L	57.1	46.0	120
		EP132: 7,12-Dimethylbenz(a)anthracene	57-97-6	2 µg/L	73.5	21.0	135
		EP132: Acenaphthene	83-32-9	2 µg/L	67.1	62.0	114
		EP132: Acenaphthylene	208-96-8	2 µg/L	67.8	61.0	119
		EP132: Anthracene	120-12-7	2 µg/L	71.3	68.0	116
		EP132: Benz(a)anthracene	56-55-3	2 µg/L	78.1	67.0	122



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Spike	Spike Recovery(%)	Acceptable Limits (%)	
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 7028530) - continued				Concentration	MS	Low	High
ES2537108-002	MW2	EP132: Benzo(a)pyrene	50-32-8	2 µg/L	78.3	72.0	114
		EP132: Benzo(b+j)fluoranthene	205-99-2	2 µg/L	80.3	69.0	119
			205-82-3				
		EP132: Benzo(e)pyrene	192-97-2	2 µg/L	76.4	71.0	119
		EP132: Benzo(g.h.i)perylene	191-24-2	2 µg/L	73.4	49.0	133
		EP132: Benzo(k)fluoranthene	207-08-9	2 µg/L	75.4	71.0	124
		EP132: Chrysene	218-01-9	2 µg/L	73.7	70.0	118
		EP132: Coronene	191-07-1	2 µg/L	70.5	29.0	138
		EP132: Dibenz(a.h)anthracene	53-70-3	2 µg/L	74.2	60.0	122
		EP132: Fluoranthene	206-44-0	2 µg/L	77.9	65.0	121
		EP132: Fluorene	86-73-7	2 µg/L	71.7	63.0	118
		EP132: Indeno(1.2.3.cd)pyrene	193-39-5	2 µg/L	75.2	57.0	123
		EP132: Naphthalene	91-20-3	2 µg/L	60.8	53.0	115
		EP132: Perylene	198-55-0	2 µg/L	74.4	71.0	118
		EP132: Phenanthrene	85-01-8	2 µg/L	71.0	67.0	120
		EP132: Pyrene	129-00-0	2 µg/L	77.1	70.0	117



## QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2537108	Page	: 1 of 8
Client	: ROBERT CARR & ASSOCIATES P/L	Laboratory	: Environmental Division Sydney
Contact	: MS FIONA BROOKER	Telephone	: +61-2-8784 8555
Project	: 12513e	Date Samples Received	: 24-Nov-2025
Site	: ----	Issue Date	: 02-Dec-2025
Sampler	: MH	No. of samples received	: 9
Order number	: ----	No. of samples analysed	: 9

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

### ***Summary of Outliers***

#### ***Outliers : Quality Control Samples***

This report highlights outliers flagged in the Quality Control (QC) Report.

- NO Method Blank value outliers occur.
- NO Duplicate outliers occur.
- NO Laboratory Control outliers occur.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, where applicable to the methodology, NO surrogate recovery outliers occur.

#### ***Outliers : Analysis Holding Time Compliance***

- NO Analysis Holding Time Outliers exist.

#### ***Outliers : Frequency of Quality Control Samples***

- NO Quality Control Sample Frequency Outliers exist.

## Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: WATER

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Matrix Spike (MS) Recoveries</b>							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	ES2537108--004	MW4	Acenaphthene	83-32-9	0.0 %	70.0-130%	Recovery less than lower data quality objective
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	ES2537108--004	MW4	Pyrene	129-00-0	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP080/071: Total Petroleum Hydrocarbons	ES2537108--004	MW4	C10 - C14 Fraction	---	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP080/071: Total Petroleum Hydrocarbons	ES2537108--004	MW4	C15 - C28 Fraction	---	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP080/071: Total Petroleum Hydrocarbons	ES2537108--004	MW4	C29 - C36 Fraction	---	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	ES2537108--004	MW4	>C10 - C16 Fraction	---	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	ES2537108--004	MW4	>C16 - C34 Fraction	---	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

## Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: WATER

Evaluation: ✗ = Holding time breach ; ✓ = Within holding time.

Method	Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EG020F: Dissolved Metals by ICP-MS</b>									
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)	MW1, MW3, MW10,	MW2, MW4, QA	24-Nov-2025	----	----	----	27-Nov-2025	23-May-2026	✓



Matrix: WATER									Evaluation: ✗ = Holding time breach ; ✓ = Within holding time.					
Method	Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis								
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation						
<b>EG035F: Dissolved Mercury by FIMS</b>														
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)	MW1, MW3, MW10,	MW2, MW4, QA	24-Nov-2025	---	---	---	01-Dec-2025	22-Dec-2025	✓					
<b>EK055G: Ammonia as N by Discrete Analyser</b>														
Clear Plastic Bottle - Sulfuric Acid (EK055G)	MW1, MW3, MW6, QA	MW2, MW4, MW10,	24-Nov-2025	---	---	---	28-Nov-2025	22-Dec-2025	✓					
<b>EK057G: Nitrite as N by Discrete Analyser</b>														
Clear Plastic Bottle - Natural (EK057G)	MW1, MW3, MW6, QA	MW2, MW4, MW10,	24-Nov-2025	---	---	---	25-Nov-2025	26-Nov-2025	✓					
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>														
Clear Plastic Bottle - Sulfuric Acid (EK059G)	MW1, MW3, MW6, QA	MW2, MW4, MW10,	24-Nov-2025	---	---	---	28-Nov-2025	22-Dec-2025	✓					
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>														
Amber Glass Bottle - Unpreserved (EP075(SIM))	MW4		24-Nov-2025	25-Nov-2025	01-Dec-2025	✓	01-Dec-2025	04-Jan-2026	✓					
<b>EP080/071: Total Petroleum Hydrocarbons</b>														
Amber Glass Bottle - Unpreserved (EP071)	MW4		24-Nov-2025	25-Nov-2025	01-Dec-2025	✓	02-Dec-2025	04-Jan-2026	✓					
Amber Glass Bottle - Unpreserved (EP071)	MW1, MW3,	MW2, QA	24-Nov-2025	25-Nov-2025	01-Dec-2025	✓	28-Nov-2025	04-Jan-2026	✓					
Amber TOC Vial - Sulfuric Acid (EP080)	TRIP BLANK		17-Nov-2025	29-Nov-2025	01-Dec-2025	✓	29-Nov-2025	01-Dec-2025	✓					
Amber VOC Vial - Sulfuric Acid (EP080)	MW4		24-Nov-2025	29-Nov-2025	08-Dec-2025	✓	01-Dec-2025	08-Dec-2025	✓					
Amber VOC Vial - Sulfuric Acid (EP080)	MW1, MW3,	MW2, QA	24-Nov-2025	29-Nov-2025	08-Dec-2025	✓	29-Nov-2025	08-Dec-2025	✓					



Matrix: WATER

Evaluation: ✗ = Holding time breach ; ✓ = Within holding time.

Method	Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>								
Amber Glass Bottle - Unpreserved (EP071) MW4		24-Nov-2025	25-Nov-2025	01-Dec-2025	✓	02-Dec-2025	04-Jan-2026	✓
Amber Glass Bottle - Unpreserved (EP071) MW1, MW2, MW3,	QA	24-Nov-2025	25-Nov-2025	01-Dec-2025	✓	28-Nov-2025	04-Jan-2026	✓
Amber TOC Vial - Sulfuric Acid (EP080) TRIP BLANK		17-Nov-2025	29-Nov-2025	01-Dec-2025	✓	29-Nov-2025	01-Dec-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080) MW4		24-Nov-2025	29-Nov-2025	08-Dec-2025	✓	01-Dec-2025	08-Dec-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080) MW1, MW2, MW3,	QA	24-Nov-2025	29-Nov-2025	08-Dec-2025	✓	29-Nov-2025	08-Dec-2025	✓
<b>EP080: BTEXN</b>								
Amber TOC Vial - Sulfuric Acid (EP080) TRIP BLANK, TRIP SPIKE		17-Nov-2025	29-Nov-2025	01-Dec-2025	✓	29-Nov-2025	01-Dec-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080) MW4		24-Nov-2025	29-Nov-2025	08-Dec-2025	✓	01-Dec-2025	08-Dec-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080) MW1, MW2, MW3,	QA	24-Nov-2025	29-Nov-2025	08-Dec-2025	✓	29-Nov-2025	08-Dec-2025	✓
<b>EP132B: Polynuclear Aromatic Hydrocarbons</b>								
Amber Glass Bottle - Unpreserved (EP132) QA		24-Nov-2025	26-Nov-2025	01-Dec-2025	✓	01-Dec-2025	05-Jan-2026	✓
Amber Glass Bottle - Unpreserved (EP132) MW1, MW2, MW3		24-Nov-2025	26-Nov-2025	01-Dec-2025	✓	27-Nov-2025	05-Jan-2026	✓

## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: WATER

Evaluation: ✘ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Analytical Methods	Count		Rate (%)			Quality Control Specification
		Method	QC	Regular	Actual	Expected	
<b>Laboratory Duplicates (DUP)</b>							
Ammonia as N by Discrete analyser	EK055G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	10	20.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	2	50.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
<b>Laboratory Control Samples (LCS)</b>							
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
<b>Method Blanks (MB)</b>							
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
<b>Matrix Spikes (MS)</b>							
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Matrix: WATER Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Analytical Methods	Method	Count		Rate (%)		Quality Control Specification
			QC	Regular	Actual	Expected	
<b>Matrix Spikes (MS) - Continued</b>							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)		EP132	1	4	25.00	5.00	✓ NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction		EP071	1	10	10.00	5.00	✓ NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX		EP080	1	20	5.00	5.00	✓ NEPM 2013 B3 & ALS QC Standard

## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH <sub>3</sub> G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO <sub>2</sub> - B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO <sub>3</sub> - F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NO <sub>x</sub> ) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO <sub>3</sub> - F. Combined oxidised Nitrogen (NO <sub>2</sub> +NO <sub>3</sub> ) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	WATER	In house: Referenced to USEPA 3640 (GPC Cleanup), 8270 GCMS Capillary column, SIM mode. This method is compliant with NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
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<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Sep. Funnel Extraction /Acetylation of Phenolic Compounds	ORG14-AC	WATER	In house: Referenced to USEPA 3510 (Extraction) / In-house (Acetylation): A 1L sample is extracted into dichloromethane and concentrated to 1 mL with exchange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.



## CHAIN OF CUSTODY

ALS Laboratory:  
please tick →

<input type="checkbox"/> ADELAIDE 21 Burma Road Poonkka SA 5096 Ph: 08 8359 0920 E: <a href="mailto:adelaide@alsglobal.com">adelaide@alsglobal.com</a>	<input type="checkbox"/> MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: <a href="mailto:mackay@alsglobal.com">mackay@alsglobal.com</a>	<input type="checkbox"/> NEWCASTLE 5/565 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: <a href="mailto:samples.newcastle@alsglobal.com">samples.newcastle@alsglobal.com</a>	<input type="checkbox"/> SYDNEY 277-269 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: <a href="mailto:samples.sydney@alsglobal.com">samples.sydney@alsglobal.com</a>
<input type="checkbox"/> BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: <a href="mailto:samples.brisbane@alsglobal.com">samples.brisbane@alsglobal.com</a>	<input type="checkbox"/> MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 5549 9600 E: <a href="mailto:samples.melbourne@alsglobal.com">samples.melbourne@alsglobal.com</a>	<input type="checkbox"/> NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: <a href="mailto:nowra@alsglobal.com">nowra@alsglobal.com</a>	<input type="checkbox"/> TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0800 E: <a href="mailto:towns.ville.environmental@alsglobal.com">towns.ville.environmental@alsglobal.com</a>
<input type="checkbox"/> GLADSTONE 48 Callomonah Drive Clinton QLD 4680 Ph: 07 7471 5890 E: <a href="mailto:gladstone@alsglobal.com">gladstone@alsglobal.com</a>	<input type="checkbox"/> MUDGEES 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 8735 E: <a href="mailto:mudgee.mail@alsglobal.com">mudgee.mail@alsglobal.com</a>	<input type="checkbox"/> PERTH 10 Hed Way Malaga WA 6090 Ph: 08 9209 7655 E: <a href="mailto:samples.perth@alsglobal.com">samples.perth@alsglobal.com</a>	<input type="checkbox"/> WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: <a href="mailto:portkentia@alsglobal.com">portkentia@alsglobal.com</a>

CLIENT: RCA Australia (ROBCAR)	TURNAROUND REQUIREMENTS : <input checked="" type="checkbox"/> Standard TAT (List due date): <b>1-12-2025</b>				FOR LABORATORY USE ONLY (Circle)
OFFICE: 92 Hill Street, Carrington	(Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)				Custody Seal Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
RCA Ref No: 12513e	ALS QUOTE NO.: EN/222/24	COC SEQUENCE NUMBER (Circle)			Freelice / frozen ice bricks present upon receipt? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
PROJECT MANAGER: Fiona Brooker	CONTACT PH: 0408 687 529	COC: 1 OF: 1			Random Sample Temperature on Receipt: <b>1.8</b> °C
SAMPLER: <b>MH</b>	SAMPLER MOBILE: <b>0401905593</b>	RELINQUISHED BY: <b>Muhammad</b>	RECEIVED BY: <b>SA 24.11.25</b>	RELINQUISHED BY: <b>SA 24.11.25</b>	RECEIVED BY: <b>SA 24.11.25</b>
COC emailed to ALS? (NO)	EDD FORMAT (or default):	DATE/TIME: <b>24.11.25, 6:58PM</b>	DATE/TIME: <b>1652</b>	DATE/TIME: <b>1700</b>	DATE/TIME: <b>24/11/2020</b>
Email Reports to: <a href="mailto:administrator@rca.com.au">administrator@rca.com.au</a> + <a href="mailto:enviro@rca.com.au">enviro@rca.com.au</a>					
Email Invoice to: as above					

### COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).							Additional Information		
	LAB ID	Sample ID	Date / Time	Matrix	Type & Preservative (refer to codes below)	Total Containers	W05 TRH, BTEX, 8 dissolved metals	EP132B UT PAH	PAH	Please report Naphthalene results in BOTH BTEX and PAH suites	EKu5G Ammonia	NT-24 Nitrite + Nitrate	W-18 TRH C6-C9 / BTEX	W-02 8-metals	
1	MW1	<b>24.11.25</b>	Water	2*500mL AG, 2*100mL AG, 2 purple vials, 1 purple plastic, 1 red plastic, 1 500mL green plastic	7	x	x		x	x	x	x			Double Sample provided for internal QA
2	MW2	<b>24.11.25</b>	Water	1*500mL AG, 1*100mL AG, 2 purple vials, 1 purple plastic, 1 red plastic, 1 500mL green plastic	7	x	x		x	x	x	x			
3	MW3	<b>24.11.25</b>	Water	1*500mL AG, 1*100mL AG, 2 purple vials, 1 purple plastic, 1 red plastic, 1 500mL green plastic	9	x	x		x	x	x	x			<b>Double sample for blank QA</b>
4	MW4	<b>24.11.25</b>	Water	1*500mL AG, 1*100mL AG, 2 purple vials, 1 purple plastic, 1 red plastic, 1 500mL green plastic	7	x			x	x	x	x			WATERS CONTAIN HIGH CONCENTRATIONS OF HYDROCARBONS
5	MW6	<b>24.11.25</b>	Water	1 purple plastic, 1 500mL green plastic	2						x	x			
6	MW10	<b>24.11.25</b>	Water	1 purple plastic, 1 red plastic, 1 500mL green plastic	3						x	x		x	
7	QA	<b>24.11.25</b>	Water	1*500mL AG, 1*100mL AG, 2 purple vials, 1 purple plastic, 1 red plastic, 1 500mL green plastic	7	x	x		x	x	x	x			
8	TRIP BLANK	<b>17.11.25</b>	Water	vial	1								x		
9	TRIP SPIKE	<b>17.11.25</b>	Water	vial	1								x		
					TOTAL	42	5	5	1	5	7	7	2	1	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic  
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphite Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Fc = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Telephone: +61 2 8784 8555



Environmental Division  
Sydney  
Work Order Reference  
**ES2537108**

E-MAILED  
LAB OF ORIGIN:  
NEWCASTLE



## SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: ES2537108		
Client	: ROBERT CARR & ASSOCIATES P/L	Laboratory	: Environmental Division Sydney
Contact	: MS FIONA BROOKER	Contact	: Danae Hamblly
Address	: PO BOX 175 CARRINGTON NSW, AUSTRALIA 2294	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: fionab@rca.com.au	E-mail	: danae.hamblly@alsglobal.com
Telephone	: +61 02 4902 9200	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 4902 9299	Facsimile	: +61-2-8784 8500
Project	: 12513e	Page	: 1 of 3
Order number	: ----	Quote number	: EN2023ROBCAR0002 (NSW Custom BQ 2024)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: MH		

### Dates

Date Samples Received	: 24-Nov-2025 16:51	Issue Date	: 24-Nov-2025
Client Requested Due	: 01-Dec-2025	Scheduled Reporting Date	: 01-Dec-2025
Date			

### Delivery Details

Mode of Delivery	: Undefined	Security Seal	: Not Available
No. of coolers/boxes	: ----	Temperature	: 1.8°C - Ice present
Receipt Detail	: ----	No. of samples received / analysed	: 9 / 9

### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Sydney, NATA accreditation no. 825, site no. 10911.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

### Matrix: WATER

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EK055G Ammonia as N By Discrete Analyser	WATER - EP075 SIM PAH only	WATER - EP132B(PAH) Ultra Trace Polynuclear Aromatic Compounds	WATER - NT-04 Nitrite and Nitrate	WATER - W-02 8 Metals	WATER - W-05 TRH/BTEXN/8 Metals	WATER - W-18 TRH(C6-C9)/BTEXN
ES2537108-001	24-Nov-2025 00:00	MW1	✓		✓	✓		✓	
ES2537108-002	24-Nov-2025 00:00	MW2	✓		✓	✓		✓	
ES2537108-003	24-Nov-2025 00:00	MW3	✓		✓	✓		✓	
ES2537108-004	24-Nov-2025 00:00	MW4	✓	✓		✓		✓	
ES2537108-005	24-Nov-2025 00:00	MW6	✓			✓			
ES2537108-006	24-Nov-2025 00:00	MW10	✓			✓	✓		
ES2537108-007	24-Nov-2025 00:00	QA	✓		✓	✓		✓	
ES2537108-008	17-Nov-2025 00:00	TRIP BLANK							✓

### Matrix: WATER

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP080 BTEXN
ES2537108-009	17-Nov-2025 00:00	TRIP SPIKE	✓

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## Requested Deliverables

### ADMINISTRATOR

- *AU Certificate of Analysis - NATA (COA)	Email	administrator@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	administrator@rca.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	administrator@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	administrator@rca.com.au
- A4 - AU Tax Invoice (INV)	Email	administrator@rca.com.au
- Chain of Custody (CoC) (COC)	Email	administrator@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	administrator@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	administrator@rca.com.au

### ALL INVOICES

- A4 - AU Tax Invoice (INV)	Email	administrator@rca.com.au
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### ENVIRO

- *AU Certificate of Analysis - NATA (COA)	Email	enviro@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	enviro@rca.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	enviro@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	enviro@rca.com.au
- A4 - AU Tax Invoice (INV)	Email	enviro@rca.com.au
- Chain of Custody (CoC) (COC)	Email	enviro@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	enviro@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	enviro@rca.com.au

### FIONA BROOKER

- *AU Certificate of Analysis - NATA (COA)	Email	fionab@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	fionab@rca.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	fionab@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	fionab@rca.com.au
- Chain of Custody (CoC) (COC)	Email	fionab@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	fionab@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	fionab@rca.com.au

# Appendix D

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## Summary of Results

Sample Identification	PQL	Aquatic Ecosystem Guideline <sup>A</sup>		Human Health (Ingestion) Guideline <sup>B</sup>	MW1	MW2	MW3	MW4	MW6	MW10	
Sample Depth (m) <sup>C</sup>		99% Fresh	95% Fresh		1.76	1.43	1.29	0.99	0.75	0.00	
Date					24/11/2025	24/11/2025	24/11/2025	24/11/2025	24/11/2025	24/11/2025	
Sample Description			Clear and no odour.	Slightly turbid and no odour.			Pale brown, turbid and no odour.	Dark grey, turbid, oily sheen and strong hydrocarbon odour.	Brown, turbid and no odour.	Brown, turbid and no odour.	
Sample Purpose			Monitoring	Monitoring			Monitoring	Monitoring	Monitoring	Monitoring	
Sample collected by			RCA - MH	RCA - MH			RCA - MH	RCA - MH	RCA - MH	RCA - MH	
<b>General Waster Quality (field readings)</b>											
pH					6.43	6.34	6.40	6.27	6.32	6.38	
Electrical Conductivity (mS/cm)					0.845	6.77	8.01	4.40	6.05	17.8	
<b>Benzene, Toluene, Ethylbenzene, Xylene (BTEX)</b>											
Benzene	1	950	1	<1	<1	<1	<1	<1	--	--	
Toluene	2	180	800	<2	<2	<2	<2	<2	--	--	
Ethylbenzene	2	80	300	<2	<2	<2	<2	<2	--	--	
meta- and para-Xylene	2	275		<2	<2	<2	<2	<2	--	--	
ortho-Xylene	2	350		<2	<2	<2	<2	<2	--	--	
Total Xylenes	4		600	2	2	2	2	2	--	--	
<b>Total Recoverable Hydrocarbons (TRH)</b>											
TRH C <sub>6</sub> -C <sub>10</sub>	20			<20	<20	<20	500	--	--	--	
TRH >C <sub>10</sub> -C <sub>16</sub>	100			<100	<100	<100	5030000	--	--	--	
TRH >C <sub>16</sub> -C <sub>34</sub>	100			320	<100	<100	4590000	--	--	--	
TRH >C <sub>34</sub> -C <sub>40</sub>	100			<100	<100	<100	<9000	--	--	--	
TRH C <sub>6</sub> -C <sub>40</sub>	320	7	7	<b>430</b>	160	160	<b>9625000</b>	--	--	--	
<b>Polycyclic Aromatic Hydrocarbons (PAH)</b>											
Acenaphthene	0.1			<0.1	<0.1	<0.1	<1500	--	--	--	
Acenaphthylene	0.1			<0.1	<0.1	<0.1	<1500	--	--	--	
Anthracene <sup>D</sup>	0.1	0.01		<0.1	<0.1	<0.1	<1500	--	--	--	
Benz(a)anthracene	0.1			<0.1	<0.1	<0.1	<1500	--	--	--	
Benzo(a) pyrene <sup>D</sup>	0.05	0.1	0.01	<0.05	<0.05	<0.05	<1500	--	--	--	
Benzo(b)&(j)fluoranthene	0.1			<0.1	<0.1	<0.1	<1500	--	--	--	
Benzo(g,h,i)perylene	0.1			<0.1	<0.1	<0.1	<1500	--	--	--	
Benzo(k)fluoranthene	0.1			<0.1	<0.1	<0.1	<1500	--	--	--	
Chrysene	0.1			<0.1	<0.1	<0.1	<1500	--	--	--	
Dibenz(a,h)anthracene	0.1			<0.1	<0.1	<0.1	<1500	--	--	--	
Fluoranthene <sup>D</sup>	0.1	1		<0.1	<0.1	<0.1	<1500	--	--	--	
Fluorene	0.1			<0.1	<0.1	<0.1	10700	--	--	--	
Indeno(1,2,3-c,d)pyrene	0.1			<0.1	<0.1	<0.1	<1500	--	--	--	
Naphthalene	0.1		16	<0.1	<0.1	<0.1	<b>3600</b>	--	--	--	
Phenanthrene <sup>D</sup>	0.1	0.6		<0.1	<0.1	<0.1	16200	--	--	--	
Pyrene	0.1			<0.1	<0.1	<0.1	2310	--	--	--	
<b>Metals</b>											
Arsenic	1		13	10	<1	3	4	1	--	2	
Cadmium	0.1		0.2	2	<0.1	<0.1	<0.1	<0.1	--	0.1	
Chromium	1		1	50	<1	<1	<1	<b>3</b>	--	<1	
Copper	1		1.4	2000	<1	<1	<1	<1	--	<1	
Lead	1		3.4	10	<1	<1	<1	2	--	1	
Mercury <sup>D</sup>	0.1	0.06	0.6	1	<0.1	<0.1	<0.1	<0.1	--	<0.1	
Nickel	1		11		2	<b>29</b>	<b>12</b>	1	--	<b>16</b>	
Zinc	5		8		<b>10</b>	<b>60</b>	<b>48</b>	<b>43</b>	--	<b>201</b>	
<b>Non Metallic Inorganics</b>											
Ammonia as N (at 20 °C)	10	pH dependent	pH dependent		1900	<b>3030</b>	800	870	<b>2840</b>	190	
Nitrate + Nitrite <sup>E</sup>	10		40		<b>80</b>	<b>50</b>	20	<50	<b>22700</b>	<b>80</b>	

All results are in units of µg/L

Drinking Water arsenic guidelines are based on total arsenic

Blank Cell indicates no criterion available

Guidelines for chromium are based on Cr (VI)

PQL = Practical Quantitation Limit. Where PQL is for a summation, PQL of all components is summed and may be different from that presented by laboratory

Ecological guidelines for mercury are based on inorganic mercury

<sup>A</sup> % Protection Level for Receiving Water Type.

Drinking water guidelines for mercury are based on total mercury

<sup>B</sup> Australian Drinking Water Guidelines.

Results for TRH have been compared to TPH guidelines

<sup>C</sup> Sample depths presented are as encountered at top of pipe or at ground level if pipe below ground prior to commencement of sampling

Results shown in shading are in excess of the 99% aquatic ecosystems guidelines

<sup>D</sup> Bioaccumulative Compounds

Results shown in **BOLD** are in excess of the 95% aquatic ecosystems guidelines

<sup>E</sup> Guidelines for Lowland (Coastal) Rivers in NSW

Results shown in underline are in excess of the human health (ingestion) guideline

Ecological guidelines in *italics* are low level reliability guidelines

Where summation required (Xylene, TRH, PAH) calculation includes components reported as non detected as 1/2 PQL

Ecological arsenic guideline based on As (V) for fresh, the lowest of presented guidelines.

# Duplicate result used for nickel and ammonia due to poor RPD